THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal ESTABLISHED 1835 · THE RAILWAY RECORD.
RAILWAYS ILLUSTRATED · THE RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1
Telephone: WHitehall 9233 (12 lines) *Telegrams: "Trazette, Parl, London"*

BRANCH OFFICES
GLASGOW: 87, Union Street . . . . . *Central 4646*
NEWCASTLE-ON-TYNE: 21, Mosley Street . . *Newcastle-on-Tyne 22239*
MANCHESTER: Century House, St. Peter's Square . . . *Central 3101*
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . *Edgbaston 2466*
LEEDS: 70, Albion Street . . . . . *Leeds 27174*

Annual subscription £3 10s. 0d. post free. Single copies, One shilling & sixpence
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Vol. 94] FRIDAY, MARCH 30, 1951 [No. 13

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Ill-Informed Advice

RECENT letters to the daily press on railway economics, notably in connection with the proposed rate increases discussed elsewhere in this issue, show a strange remoteness from certain railway realities. Thus Mr. Gilbert Ponsonby, in a letter to *The Times*, advocating "some reduction in present standards of adequacy, frequency, and convenience of passenger services, possibly coupled with some reductions in passenger fares," falls into the common error (quite apart from the effect of worsened train services on passenger traffics) of underestimating the effect on working results of wages and fixed charges. Furthermore, in suggesting that the recent mileage reductions to save coal might, if wisely selected and made permanent, result in savings in cost in excess of the loss of revenue therefrom, he ignores the careful study by the railways of redundant services that has gone on for years, and the fact that what he suggests is already being done. In pleading that "these aspects of the matter should receive the closest examination before a final decision on rate increases is reached," he implies that railway managements, which exist largely for this purpose, have not already taken such action. Moreover, he propounds the fallacious alternatives of "a high quality of service . . . at a high price or a lower quality at a lower price." As things are, railway "prices" must be high, and railway services are becoming high in quality; but there is little connection between lower quality and lower price. Rather better informed is Mr. R. Gresham-Cooke, who, in advocating closing of certain stations situated close together on lines remaining open, has hit on what is often (but not always) a solution—but ignores the constant study of the railhead question being made by British Railways and the B.T.C. In giving figures to show the unremunerative character of some European secondary lines, Mr. Gresham-Cooke omits to say that many such lines (partly because they are feeders) are not being closed; nor does he realise the smallness of the economies effected in France, for instance, by such closing (*co-ordination*), or in Britain, as recently shown by Mr. John Elliot, Chairman of the Railway Executive That their efforts, both in the past and in the present, to set their house in order, should be ignored may mean that the railways in this respect at least are hiding their light under a bushel.

Summer Train Services

THE decision announced last week to restore, for the remainder of the duration of the current timetable, most of the passenger trains cancelled as a coal economy measure, is welcome. It is to be hoped that it is not too late to undo the harm done both in inconvenience to the travelling public and in uncertainty in the public mind as to services provided, as more and more trains were withdrawn—though none of this was the fault of British Railways. The only good result of the cancellations has been the *coup de grâce* given to poorly patronised services, which would have been withdrawn eventually in any case. The Railway Executive is now free (at least for the next few months, assuming no further acute coal shortage) to resume the interrupted process of restoring passenger services to pre-war levels. The problem of this year's summer timetable, due for introduction in June, is complicated by the opening early in May of the Festival of Britain. Whilst the latter is the occasion for the introduction by British Railways and by the Pullman Car Company of new trains with new stock, the summer timetable in any normal year incorporates such new developments; nor can the traffic created by the Festival be more than a small item compared with normal summer traffic in this country.

Recommendations for Canadian Railways

THE Royal Commission on Transportation which was appointed in 1948 has made its report to the Canadian Government. Its main recommendations are that freight rates should be equalised throughout Canada, there should be a $7,000,000 Federal subsidy to defray the annual maintenance cost of the main lines running across thinly-populated Northern Ontario between Sudbury and Fort William, fixed charges of the Canadian National Railways should be reduced, and a single board should be constituted to integrate transport agencies under Federal jurisdiction. The Canadian Pacific Railway should neither be nationalised nor amalgamated with the Canadian National Railways. The C.N.R. should be aided by the interest on debt not being payable except when earned, with the provision that the railway may accumulate a surplus fund for current needs. The suggestions for the Canadian National Railways, states the report, will "provide the Canadian Pacific with the protection to which it is entitled and which it needs if it is to continue to function as a healthy and vigorous private corporation." The recommendations of the Commission are not binding on the Government.

A Grant for C.I.E.

THE Irish Parliament has approved a vote of £1,413,000 for Coras Iompair Eireann to make up losses for the year ending March 31. The amount is made up of £980,000, to meet the loss on working, and £433,000 for debenture interest already paid. The loss was £736,036 on railways and £4,035 on canals, but buses showed gains of £669,045, road freight of £12,942, and hotels of £25,339. The Parliamentary Secretary to the Minister for Industry & Commerce said that C.I.E. had met unforeseen difficulties. Events had dispelled

the early hope of a net profit in actual operations in the year. The recent strike had cost it £500,000 and traffic lost as a result might not be recovered. The rise in the price of materials would cost it £400,000 in a full year—half of this increase was attributable to coal—and recent wage increases would add £350,000 to the wage bill. In addition C.I.E. had to recoup the annual loss of £1,000,000 inherited from its predecessors. Rates and fares would be raised, but too great increases might only divert traffic.

A "Raw Deal" for the G.N.R.(I.)

THE Committee of the Great Northern Railway (Ireland) Stockholders' Protection Association has published a report received from the Board on its meeting on March 12 with representatives of the Belfast and Dublin Governments, which have decided to acquire the system compulsorily for the sum of £3,900,000. "Conscience," states the Committee, "would allow no one who had read the report to be party to yet another such raw deal as it is proposed to hand out to the G.N.R." The acquisition of Coras Iompair Eireann by the Government of the Republic is shown to be no precedent; unlike those of the G.N.R.(I.), its stocks had not deteriorated because of governmental failure to fulfil a statutory trust, but had reflected public knowledge of its inability, unlike the G.N.R.(I.), to provide for renewals or maintenance. The Belfast Government relied for precedent on the acquisition of the Belfast & County Down Railway and the British railways. Arbitration was allowed for the Northern Counties Committee as it had no Stock Exchange quotations. The G.N.R.(I.), after the issue of the Northern Ireland Government White Paper proposing its merger with the N.C.C. and B.C.D.R. in a northern group, continued to maintain its undertaking at a high standard out of revenue, at the expense of dividends, although not obliged to do so. This honourable course has certainly reacted against it.

Lost Time Recovery

ON a recent journey to Exeter we came across an example of train operation which did credit to all concerned. The 3 p.m. express from Waterloo had been delayed by a special stop to examine the train and by permanent way relaying, and the Exmouth Junction engine crew who took over the "Merchant Navy" Pacific at Salisbury left 19 min. late by the advertised time, and 17 min. late by the working time. Yet they worked their train into Exeter Central less than 1 min. late, despite a permanent way check beyond Sherborne costing 2 min.; there were no signal checks. Speeds were high, reaching or exceeding 80 m.p.h. at six points, but it was the energy uphill, such as the minimum of 51 m.p.h. up 4½ miles of 1 in 80 to Honiton Tunnel that contributed so largely to the time recovery, as also the smart working at Templecombe and Sidmouth Junction stops, which between them economised 2½ min. Though the load was light, 269 tons to Templecombe and 202 tons beyond, that does not alter the fact that there would have been no dereliction of duty on the part of the engine-crew had they maintained their point-to-point booked times, and reached Exeter as late as they left Salisbury. The run was a refreshing example of team work.

Push-Button or Automatic Train Describers

TECHNICAL progress in some directions has reached the point where a choice has to be made between what is possible and what is considered both economical and convenient from the point of view of maintenance. Two train describer installations for recent resignalling schemes on British Railways represent different opinions in this matter. The Southern Region, in extending colour-light signalling on the Central Section main line to Brighton, is continuing to instal equipment in which descriptions are sent from box to box by certain push-button operations carried out by the signalmen. In contrast, the Eastern Region is adopting for the Liverpool Street to Shenfield scheme the system mentioned in our December 15, 1950, issue, in which a description, once initiated, is sent forward automatically and switched over to the appropriate instrument when a train changes from one line to another. An article on another page gives some details of the Southern Region apparatus, of which the latest application has been in the three new all-electric signal boxes for Stage 1 of the Brighton line resignalling, described in our January 12 issue. While more complex apparatus relieves the signalman of certain tasks, the objection is heard sometimes that in correcting a possible fault another may be introduced which does not become apparent until later. Only experience will show whether such doubts are justified.

The Semmering Tunnel Problem

THE Austrian Federal Railways line from Vienna to Italy *via* Carinthia and to Graz and Trieste traverses the Semmering Pass in a double-line tunnel 4,691 ft. in length, built between 1848 and 1852. Since then, constant seepage of water, resulting in damage by frost, has necessitated frequent repairs and piecemeal relining. In 1947, the lining had deteriorated so seriously that it was decided to reinforce it immediately with steel ribs and timber crown bracing, but it was realised that more drastic measures would be necessary in the near future. Accordingly, expert geological and engineering opinions were sought. Both agreed that the existing tunnel could not be repaired effectively in existing traffic conditions and that, in present circumstances, a new parallel single-line tunnel and retention of the old tunnel, repairable under single line traffic, were the best solution of the problem. The geologist recommended a minimum axial distance of 150 ft. between the old and new tunnels, and the engineer's view was that the new one should be constructed from both ends and also from adits driven from the old tunnel, a method possible if single-line working in it was introduced, as described in an article elsewhere in this issue.

Derailment near Tollerton

THE derailment of an express near Tollerton on June 5, 1950, was inquired into by Colonel D. McMullen, whose report is summarised in this issue. The up "Flying Scotsman" had passed over the site some 15 min. before the derailed train, and had been stopped by the guard, who had felt something unusual in the running. His evidence was not very satisfactory. A carriage and wagon examiner said that the guard told him that he had been so violently thrown about that it seemed as if they had been off the road; the guard denied saying any such thing. Colonel McMullen sees no reason to doubt the foreman's word and considers that the guard cannot escape all blame. He should have stopped the train again at Beningbrough and reported the matter or at least have telephoned earlier asking for the following train to be cautioned. The weather was very hot, and "freezing" of some fishplates had set up heavy stresses in the track, which became sufficiently released to cause buckling by the passing of the "Scotsman." The accident was, states the report, mainly the result of failure of permanent way staff to carry out completely the instructions on special precautions to be taken in hot weather; shortage of ballast contributed.

A South African Condensing Locomotive

IN 1931 the firm of Henschel & Sohn, G.m.b.h., constructed for the Argentine State Railways the first of a new type of condensing locomotive, in which the steam was conveyed to a cooling plant in the tender, and there condensed to be fed back into the boiler. It was described in detail in the June, 1932, issue of *The Railway Engineer*. The contract stipulated that it should be capable of running 375 miles hauling a normal load without having to take in water *en route;* in fact, it covered the 475 miles between Tucuman and Santa Fe with a consumption of only 896 gal. Since then, similar locomotives have been built for other countries, by far the most for Germany, which used large numbers of them in Russia during the war. The firm last year delivered to the South African

Railways condensing plant consisting of a special tender and engine equipment for a 2-10-2 locomotive. It is described elsewhere in this issue. Trials have shown that it can run 400 miles on one filling of water.

Railway Charges

AN application to the Minister of Transport by the British Transport Commission for authority to increase its charges to offset the recent railway wage increases and other higher outgoings was inevitable. The form it has taken, as announced by Mr. Barnes in the House of Commons last week, is a request for a flat increase of 10 per cent. in railway freight charges, parcels rates, and docks and canal charges; the total estimated yield of this in a full year is £20,000,000, which still leaves a gap before the net B.T.C. revenue deficit this year of £25,000,000 can be made up, apart from accumulated deficits of £40,000,000. The proposed increase, moreover, embraces all railway freight charges, and therefore those traffics (largely the more highly rated) which are most sensitive to rate advances and thus likely to be lost to the railways. Whether Mr. Barnes, who is awaiting the advice, which he is not bound to take, of the permanent members of the Transport Tribunal, will approve the B.T.C. application is not yet known. Opposition to the proposals is already making itself felt, and there is a demand for a public inquiry.

The proposed increases do not embrace passenger traffic, for two reasons: the inability of this traffic to bear any increase, to which we have referred in recent issues of this journal, and the imminence of a passenger charges scheme. How far the priority of the passenger scheme is due to its possible greater simplicity compared with freight, or to a wish to effect immediate freight rate increases necessitating postponement of the freight charges scheme, is immaterial. It seems clear at least that the passenger scheme will be both comprehensive and in some degree final. It may be that the experience gained and questions answered in the work on the London passenger charges scheme, which took something like a year to formulate, approve, and put into operation, will enable the new passenger scheme to become effective in a shorter period, even although it is complicated by the wider area it covers and the multiplicity of transport undertakings involved; nor is it clear what part the proposed "Area Schemes" for road passenger transport, some of which have been under consideration for a long time, will play in any charges scheme. Any such scheme, however, must involve a public hearing, and for that reason it is very unlikely that any passenger scheme can come into operation this year.

The same is true also of the freight charges scheme, which has no precedent such as the London passenger scheme on which to work. Nevertheless, this, too, it is said by the Minister of Transport, will "follow soon" after its passenger counterpart. To judge by the opposition to the B.T.C. interim proposals as to railway rates (which raise less fundamental, if important, issues), any freight scheme must arouse much opposition, and the issues are complex.

By the terms of the Transport Act the members of the Transport Tribunal whom the Minister consults regarding rate increases are not bound to hear evidence in public. There is, however, a good precedent for their so doing in the application in the 16⅔ per cent. increase in railway rates effective from last May as has already been urged in the House of Commons. Although the matter is urgent, it would be inexpedient lightly to disregard the many objections. These are typified in the Federation of British Industries protest that the Commission "appears to expect industry and commerce to bear the whole of the burden." Obviously the proposed increases, if authorised, will set in motion a wave of price increases. Nevertheless, as (pending integration of transport) no further drastic economies can yet be effected on British Railways, for reasons we have already given, and as the deficit on nationalised transport cannot be allowed to grow indefinitely, there seems to be no alternative to increases in railway freight rates.

British Standard Locomotives

ONE of the most interesting papers presented to the Institution of Locomotive Engineers for some time was that given on March 21, entitled "British Standard Locomotives," by Mr. E. S. Cox, Executive Officer (Design) Railway Executive. The paper dealt in great detail with the designs of the new British Railways locomotives, and gave reasons for the adoption of certain features designed to obtain greater availability and reduction in mechanical maintenance combined with reduced maintenance costs. Mr. Cox said that any decision as to methods of traction lies in the realms of national policy, of fuel supplies, and of long range economies, rather than in the sphere of engineering.

While steam traction is still in being, it is capable, like other forms of motive power, of continued development to obtain lower costs with great effectiveness. Standardisation of locomotives and their components was not a function of nationalisation. Standardisation within individual organisations was a commonplace, but there had been a few cases before today of trends towards a wider use of certain locomotive types spanning several administrations.

After a survey of practice at home and abroad, it was concluded that for as long as the steam locomotive had a place to fill, its best opportunity for progress lay in the direction of higher availability and lower maintenance costs rather than in seeking higher thermal efficiency. Among the objectives of the new designs were the utmost steam-producing capacity permitted by weight and dimensions, simplicity with the least number of working parts all readily accessible, each type to give the widest range of mixed-traffic working, and high-level bearing performance by the adoption of roller bearings where financially justified, or the use of manganese steel liners with ample proportioned plain bearings. Mr. Cox said that bar frames were considered, but available handling space and the machine capacity in railway shops were insufficient. Use of these frames would increase both cost and weight and their adoption had to be abandoned.

The interchange trials which had been carried out had shown that fine steps in wheel dia. were unnecessary and locomotives having 6-ft. 2-in. wheels could deal with running speeds up to 80 m.p.h.; this was substantiated in a later series of trials on the Eastern Region between "A1" and "A2" class Pacific engines. A 6-ft. 2-in. wheel dia. was therefore adopted. Except in the case of the largest 4-6-2 engines not yet in contemplation, the use of two-cylinder locomotives was decided on for various reasons, among which were simplicity and accessibility. Crankaxles were expensive in first cost and maintenance. Theoretically, multi-cylinder engines should be better at starting than two-cylinder locomotives, but this, said Mr. Cox, was not observable in practice, also four exhausts each revolution in general promoted better steaming than six or eight, other things being equal.

One of the most important but little noticed developments after the 1923 grouping of railways was the gradual enlargement of the more restrictive rolling stock gauges and the establishment of a more rational basis on which allowable axle weights and hammer blows were determined. This work was concluded by the issue in 1949 of two gauges, L1 and L2. It was of considerable value to the designers to have so clear-cut a solution to loading gauge requirements available before detail design was commenced, and it was decided that all locomotives of Class "4" and below should conform to L1 and all Class "5" and upwards should come within gauge L2. The question of route availability so far as hammer blow was concerned was one of great complexity, and a final solution on rational grounds was being worked on, but had not yet been finalised.

The Bridge Stress Committee Report, 1928, published in our issue of February 1, 1929, recommended that all future locomotives should be so designed that, at a speed of 5 r.p.s. the axle hammer blow would not exceed one fourth the static load with a maximum of 5 tons, and that the whole of the engine blow should not exceed 12½

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tons, which represented a considerable reduction on prevailing values at that time. Making use of data now available, the proportion of reciprocating weights balanced has been limited to 40 per cent., on the heavier of the new British Railways locomotives and 50 per cent. on the lighter. For the largest engines in the series, *i.e.*, those most likely to attain high speeds, the hammer blow is only half that set out in the Bridge Stress Committee's report. This represented a contribution to track maintenance, leaving only a marginal further improvement which could be looked to in the complete elimination of hammer blow.

By the use of multi-cylinders, where two will do the work required, the weights of the Pacific type engines would be increased by 3½ tons, first cost would be increased by £1,000, preparation time would be increased at least by one-third and examination repair costs would continue throughout the life of the locomotive because of the greater number of parts to be dealt with. The two-cylinder arrangement, therefore, had been accepted as the best all round compromise. No standardisation scheme can remain static, and examination of details from the point of view of more economical manufacture or maintenance is a never ending process. Where financially justified, the provision of poppet valves, rotary driven cam gears, fully controlled water treatment and harder wearing materials all require consideration for future application.

The design then of the new standard locomotives does not embody any revolutionary feature. Considerable economies should accrue by the provision of two-cylinders, more accessible moving parts, reduced maintenance charges, which are of a recurring nature, and an improved repair period, the latter providing improved availability.

The U.S.A. Railways in 1950

IN our February 23 issue we made a preliminary survey of last year's operations on the U.S.A. railways. Details of 1950 revenues and expenses are now to hand and show a marked improvement in the railway position, compared with 1949. The financial results of the Class I railways are summarised in the table below.

	1950 (millions)	1949	Percentage increase 1950 on 1949
Total operating revenues	$9,473	$8,580	10
,, ,, expenses	$7,059	$6,892	2
Taxes and other imposts	$1,373	$1,001	37
Net railway operating income (earnings before charges)	$1,040	$687	51
Net income (estimated) ... ... (earnings after charges)	$786	$484	81

The net railway operating income is the highest the railways have enjoyed in peacetime since 1929. It represented a return of 4·22 per cent. on property investment, compared with a return of only 2·86 per cent. in 1949. Net income was also the highest earned in peacetime since 1929. Every revenue account improved, except passenger receipts which decreased by $47 million, or 5·5 per cent.; even in the Eastern District, where fares were advanced in December, 1949, receipts dropped by 5 per cent. In contrast a larger volume of freight movement produced $769 million of additional revenue, an increase of 10·9 per cent. A high standard of operating efficiency held down expenses. The operating ratio of 74·5 per cent. was the lowest figure recorded for 6 years and compared favourably with the 1949 ratio of 80 per cent.

Part of the betterment in freight train working was due to the development of diesel traction. With more diesel-electrics hauling heavy freight trains quickly over many lines, the unit output per hour of freight train operation by all types of motive power was an all-time record. The substitution of diesel-electric for steam locomotives proceeds apace in 1951. In January only one of the 219 locomotives installed was a steam engine. The 218 diesels brought the total number of complete diesel locomotives in use to 10,033, consisting of 14,458 units. A "percentage under repair" of 1·1 for diesels on February 1, compared with 5·8 for electric locomotives and 12·9 for steam engines, establishes the reliability of the new machines.

The weak point in last year's working arrangements was the failure to maintain an adequate supply of wagons from July onwards, when traffic was unexpectedly heavy. The difficulties have not been overcome yet. In the week ended February 10 last, there was an average daily shortage of over 20,000 wagons. The railways cannot get prompt delivery of large numbers of new wagons ordered last year. They have, however, obtained the use of 28,000 extra wagons by reducing the number waiting repair to 5 per cent. of the total stock. The turn-round time of wagons was reduced in January to 15·7 days from 19·1 days in January, 1950. The average detention of wagons over the free time of 48 hours has also been less this year. By means of these devices, wagon loadings for the first 6 weeks of 1951 were 18·5 per cent. higher than in the corresponding weeks of 1950, though a yard shunters' strike cause the loss of 375,000 wagon loads of traffic. Present indications are that in 1951 the U.S.A. railways will handle more traffic, both by freight and passenger train services, than they carried in 1950.

Rebuilding a Scottish Culvert

THE damage to the East Coast main line between Berwick and Edinburgh by the floods in August, 1948, and the measures taken to repair it have been described at various times in this journal, notably in the August 27, September 17, and October 29, 1948, and September 23, 1949, issues. The reconstruction of culvert No. 146 is of unusual interest, and is the subject of a paper recently presented to the Institution of Civil Engineers by Mr. John Graham, B.Sc. This culvert carries the Horn Burn through a double-line embankment 500 ft. long and 50 ft. high from the bed of the burn, about nine miles from Berwick. The original structure consisted of an 8 ft. semi-circular masonry arch, 216 ft. long, and its crown was about 8 ft. above the bed. The catchment area of the burn above the culvert is about 2,200 acres. The embankment is composed of red marl containing 20-40 per cent. stones and boulders excavated from nearby cuttings.

Due to the flood, the culvert collapsed and slips occurred on both sides of the embankment, forming a dam impounding a 60-acre lake. Though a neighbouring 2-ft. × 1-ft. field drain serving a subsidiary valley carried off some of this water under the line, it was headed up against the embankment at the culvert to a depth of 28 ft. To release this water a timbered trench was cut through the embankment 40 yd. from the culvert and clear of the slips; it had to be taken down the full 50 ft. to enable the new culvert to be built in the dry. The work of excavating this trench began well but was soon slowed down by the mud and water encountered, and it was decided to obtain the help of the Metropolitan Water Board to pump out the remaining water. The plant provided by the Board had been used in the Fen floods in the previous year. It consisted of four electric pumps each with a capacity of 2,000 gal. a min. Pumping continued until the trench was completed and was able to take the burn; two 3 ft. concrete pipes were laid in it for this purpose.

For rebuilding the culvert two rows of No. 3 Larssen sheet piling were driven 10 ft. on each side of the centre line of the culvert, which was on a 57 deg. skew. Behind them similar piles were welded together and driven as box piles in clusters to a depth of 58 ft. below rail level, to form abutments for two single-line plate-girder temporary 40-ft. spans over the reconstruction work. Two 24-ft. R.S.J. spans were also erected on timber-crib abutments to carry the tracks over the timbered trench, which was, however, filled in shortly afterwards. The completion of this stage of the work enabled double-line running to be resumed.

The original design of the new culvert took the form of a R.C. box 10 ft. wide, 12 ft. high and 2 ft. thick with mass concrete head- and wing-walls and R.C. aprons and drop walls. The pile driving was carried on by steam crane with single-line possession at week-ends, but it was soon found that the piles were not being driven vertically.

This was due to the sodden state of the embankment and to the uneven loading caused by the skew; the heads of the piles moved against the direction of traffic and their toes moved with it. The plan to build a box culvert in an open trench was therefore abandoned in favour of driving a tunnel under the formation and for a distance of 40 ft. on each side of it. For the construction of the various walls at different levels and for the ends of the culvert sheet-piling coffer dams were used arranged as upper and lower cells.

Meanwhile, bore holes were driven at intervals and a trial-pit was dug, from which samples of the soil showed large patches of soft material throughout the embankment, and water flowed from the latter into the pit. The Department of Industrial & Scientific Research was consulted and agreed to test samples and give advice. On the basis of reports by the Building Research Station on the soil and the relation between its moisture content and compression strength, and on the probable effectiveness of its treatment by the electro-osmosis method, it was decided to apply this method in the field to dry out the worst soil in the embankment. On the whole results were satisfactory but some difficulties were encountered. For instance, the soil drying out round the cathodes restricted the flow of water into the well tubes, and round the anodes the soil was found to dry out to a distance of only 2 ft. to 3 ft.; they must therefore not be too far apart to be effective.

The tunnelling was carried on throughout the 24 hr. in two shifts. The upper half of the face was supported by vertical timber legs taking the front end of the head boards, supported on a sill placed on the diameter, and the lower half by horizontal poles, the whole being held on timber back-kickers placed in the tunnel lining, through walings and struts. A short box heading was kept going in the upper half 8 ft. ahead of the main face. As no difficulties were experienced it was decided to continue the tunnel right out to the upstream head-wall. Finally, it was lined with reinforced-concrete 1 ft. thick.

Trans-Zambesia Railway

THE gross receipts for 1949 of the Trans-Zambesia Railway Co. Ltd., of which Mr. V. L. Oury is Chairman, are shown in the annual report as £449,708, whilst working expenses were £391,750. After adding interest on investments and certain other items to the profit on working the railway, there remains a balance of £63,062. Interest on the income bonds amounted to £4,208, and, after meeting the service of the 3½ per cent. first debenture stock, there was available £17,273 for interest on the 5 per cent. income debenture stock. Working expenses were 87 per cent. of gross receipts, compared with 90 per cent. in 1948.

The following table gives a comparison of some of the principal results:—

	1948	1949
Goods tonnage	197,686	246,469
	£	£
Goods receipts	287,277	370,907
Livestock & vehicle receipts	3,703	2,927
Passenger receipts	59,287	61,199
Baggage & parcel receipts	6,668	8,387
Gross receipts	369,417	449,708
Working expenses	332,122	391,750
Surplus	37,295	57,958

The Chairman states that the year was one of progress. The coming into service of new locomotives and wagons enabled the railway to clear all arrears of traffic, and to deal reasonably promptly with increased current traffics. Deliveries of essential materials were still far from satisfactory. Despite this, 25 per cent. more goods traffic was handled than in the previous year. During the first six months of 1950 traffics showed an increase over those of the previous year and progress towards a complete return to normal working continued. The company now is able to proceed with the programme for the improvement of its track, 30,000 steel sleepers having been delivered, and stone crushing plants shipped.

Allusion is made by Mr. Oury to the development of the Port of Beira, where it is expected that a new deep-water wharf will be completed by the end of 1951 and further handling and storage facilities are being provided. As a consequence of the taking over by the Portuguese Government of the operation of the port, in January, 1949, and of the Beira Railway, in October, 1949, a considerable amount of re-organisation was necessary; this has now been effected, and it was hoped, therefore, that shipping companies would remove the surcharge of 60 per cent. on freight rates to the Beira. The relations between the Trans-Zambesia Railway and the Beira Railway and Beira Port are very close.

Regarding the Central & Southern African Transport Conference at Johannesburg last autumn (to which reference was made in *The Railway Gazette* of November 24, 1950, and preceding issues), Mr. Oury states that Senhor Correa da Silva, one of the Portuguese Government representatives on the board of the T.Z.R., was a Portuguese Government delegate, and the General Manager, Mr. Stevens, was in attendance as a technical adviser.

Nyasaland Railways Limited

THE report for 1949 of the Nyasaland Railways Limited, received from the Chairman, Mr. W. M. Codrington, shows that, after adding to the £58,094 profit on the railway various items such as subsidiary company dividends, there resulted £122,302 (against £112,750 for the previous year). After paying 3½ per cent. interest on first debentures, £23,951 remained for the 5 per cent. Zambesi bridge debenture stock, derived from the receipts of the bridge and its south approach. Of this sum of £23,951, £19,743 was in respect of the receipts of the Zambesi Bridge (compared with £8,000 in 1948) when tax adjustments were necessary as a result of the Finance Act, 1947.

Expenses continued to mount, particularly in regard to fuel; during the year it proved necessary to import coal at greatly increased cost from the Union of South Africa, which cost 110 per cent. more than coal from normal sources of supply. Provision for renewals rose to nearly £50,000, representing 12 per cent. of gross receipts. Provision also had to be made for the increased cost of replacing assets standing in the books at pre-war prices. An increase of £26,000 in miscellaneous expenses was mainly due to the cost of hire of rolling-stock and engines incurred before the arrival of seven new locomotives.

The following are the principal results for the Nyasaland Railways, excluding, that is, the subsidiary Central Africa Railway Co. Ltd.:—

	1948	1949
Goods tonnage (railway)	136,274	178,065
Passenger journeys (railway)	305,249	298,977
	£	£
Goods receipts	258,508	302,052
Livestock & vehicle receipts	1,838	1,583
Passenger receipts	54,670	52,691
Baggage & parcels receipts	5,279	4,975
Gross receipts (including road motor and lake services)	336,111	386,393
Working expenses (including road motor and lake services)	251,403	328,299

In Nyasaland, inflationary tendencies continued to operate, with the result that since the end of 1949 the Government found it necessary to sanction an increase in the minimum rate of all African wages, and there was a general increase in the cost of all salaries and wages. So far, an increasing volume of traffic had enabled the company to face rising costs without increasing its charges; but the time is approaching, the Chairman considers, when the present pre-war rates will have to be raised.

In hauling the heavy traffics now offering, the seven new locomotives were of very great assistance. The last fifty new wagons are now all in Nyasaland and most of them already in traffic. The completion of the new bridge at Chiromo in January, 1950, materially aided economical use of these additional units of rolling stock. New tank cars, all of which are now in service, materially help in efficient handling of the diesel oil and petrol. The Chairman also alludes to improvements in the Lake Nyasa services, including the radio installation described in *The Railway Gazette* issue of June 9, 1950. Progress with the manufacture of new passenger rolling stock was slow; but it was hoped that in the first half of 1951 some of the African coaches on order for over three years would be delivered.

XUM

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Closing of Branch Lines

March 12

SIR,—I note Mr. Hawker's letter in your issue of March 9. I am concerned with passenger as well as goods traffic, and have not denied that some local services can be made a paying proposition. I do not blind myself to such excellent examples as the recent Shenfield electrification, whose success is marked and a credit to all. It is the consequence of planning, and the planners were the railwaymen who have been planning throughout the history of the railways—long before planning became a smear word.

It is ludicrous to assert that the decisive factor in influencing traffic to the bus is that services at regular intervals are a concession to weak memory. Regular-interval services are important, but there are other more important factors, some of which I mentioned.

Other planners probably feel aggrieved that they cannot control the uncontrollable. Mr. Hawker himself appears to aim at planning railway services in such a way as to remedy a defect in human nature, namely, weak memory, and change human nature so much that people will choose the most inconvenient route to get from place to place.

As to icebound and flood conditions, it is a fact that some bus services are maintained and some are not, and that some railway services are maintained and some are not. As to how, I must refer Mr. Hawker to the people who do the job, and do it well.

I fervently want to see the railways used more effectively than they are, and I am quite certain they can be, but they must stop doing work for which they are not now the most suitable and economic instrument, and concentrate on that for which they remain by far the most useful and efficient.

Yours faithfully,

FREDERICK SMITH

65, Hallowell Road, Northwood

Delayed Goods

March 10

SIR,—In your March 2 issue, a correspondent, attempts, with scant courtesy, to discredit my explanation of the seemingly low average freight train loads (156 tons in 1949 and 125 tons in 1938) and average wagon loads for general merchandise (3·9 tons in 1949). He claims that if the millions of small consignments had been concentrated on fewer stations, both at the collection and delivery ends, average wagon loads of about nine tons (presumably for general merchandise) could have been obtained even with the small wagons used in 1938, and the number of wagons used reduced to about one-third; the operating methods required to attain these "absolutely essential" improvements are also outlined.

It is possible this correspondent is unaware of the zonal collection and delivery schemes initiated by the railways some time before nationalisation and expanded on a considerable scale since? These schemes, which involve the provision of a large number of "railheads" all over the country, to and from which general merchandise (other than full wagon loads) from and to all stations within prescribed "zones," is conveyed by road motor.

The main objective of these schemes was to reduce transit time—a following day delivery is aimed at and often achieved—but they have undoubtedly also contributed to a marked improvement in the average freight train load, the ton-miles per total engine hour, and the average wagon load for general merchandise, which have gone up from 125 tons, 461 ton-miles, and 3 tons, respectively, in 1938, to 156 tons, 559 ton-miles, and 3·9 tons in 1949; or in terms of percentage increases, 25, 21, and 30 per cent., respectively, surely no mean accomplishment.

With all deference to your correspondent I suggest that his claim for the attainment of an average wagon load for general merchandise of 9 tons (*i.e.* 75 per cent. of nominal capacity) by *any* operating methods is completely unrealistic, when it is remembered that a 12-ton wagon can be "fully loaded" with one ton or less of light but bulky goods; also, that there may be many cases where there would be insufficient traffic in a day between certain of the railheads to fully load a 12-ton wagon. If your correspondent would obtain permission to spend a day and a night at one of these "railheads" and carefully watch the loading, he would, I think, modify his views considerably.

The question of the provision of larger wagons is also touched on by this correspondent, but as this subject has already been debated in your columns *ad nauseam*, I do not propose to say more than that, all other considerations apart, the general financial situation at the present time precludes anything more than a very gradual improvement in this respect.

Yours faithfully,

J. H. LAUNDY

Rustington, Sussex

Improved Method of Train Time Analysis

March 17

SIR,—With reference to the article in your February 23 issue on the above subject, as an alternative to the straight-edge and set square, an adjustable set square could be used for deriving the slope of speed-distance line from the speed-force diagram. It would also obviate the need to move the train characteristic as work proceeds. Another alternative which I find most useful is to turn the train characteristic through 90° when the slope of the speed-distance curve then becomes parallel to the slope of the generator PQ.

To calculate speed on a basis of (fleeting) time is an academic exercise in applied mathematics when compared with the more easily perceived basis of distance, with its permanent features of mileposts, signals, junctions, stations, and so on. The method described offers to the amateur railwayist a new and fascinating recreation of "drawing board driving." Thank you, Mr. Grant.

Yours faithfully,

HARRY TOWNLEY

4, Compton Road, Buxton

Finding the Money

March 16

SIR,—I must contest strongly the statement made in the leader under the above head in your March 16 issue, to the effect that British Railways subsidise industry by uneconomic rates for coal and mineral traffics.

The railway companies have always stated that the cost of working traffic cannot be separated, but I must point out that the goods wagon loading and train load working of coal and mineral traffics must surely be infinitely cheaper than that of general merchandise with all the facilities for handling which have to be provided.

I must also point out that coal and mineral traffics are raw materials used in the manufacture of goods for practically every industry, and any increase in the cost of these primary products has a cumulative effect on all finished products.

Yours faithfully,

M. S. BARNARD

Steel House, Tothill Street, S.W.1

[Railway freight rates today are some 80 per cent. above pre-war; according to the Central Statistical Office digest, wholesale prices of industrial materials in January, 1951, averaged 233 per cent., and those of coal and of iron and steel were 153 and 92 per cent. respectively over the 1938 figures. This surely speaks for itself.—ED., *R.G.*]

THE SCRAP HEAP

Tribute !

I feel that a tribute should be paid to the co-operation between the B.E.A. and British Railways.

We rise by means of an electric alarm at, say, 6.30 a.m., and catch a train at 08.04. Owing to load shedding and other technical matters the clock is usually late or completely dead.

However, by excellent co-operation between the two national services I have referred to, I usually find that the train is late, very late, or doesn't appear at all.

From a letter to "The Evening News."

Railway Emblems

Who designed the "Lion on the Wheel" emblem of nationalised transport borne by British Railways engines and road transport lorries? . . . It was Mr. Cecil Thomas, the Chelsea sculptor.

The history of one emblem displaced by the lion—the old L.M.S. crest adopted in 1923—was recalled by Mr. W. H. Vine, Chief Representative, London Commercial Service, British Railways, in a speech at Willesden recently.

Sir Arthur Watson, then General Manager, had a pretty daughter, Grace, who was at an art school. Hearing he wanted a crest, she designed one in a few hours and presented it to him. It was that crest which adorned the former L.M.S.R. rolling stock for 26 years.—*From the "Daily Mail."*

Giant's Causeway Tramway Sold

The complete track and equipment of the Giant's Causeway & Portrush Tramway was auctioned on March 15 and the 25 lots fetched £11,600. The tramway was opened in 1883 by Lord Spencer, Lord Lieutenant of Ireland. It ran along the headlands from Portrush to Bushmills and the Giant's Causeway, and was well known to thousands of holidaymakers.

An Edmondson Relic

Mr. William B. Stocks, of Huddersfield, has sent us from his collection an old Lancashire & Yorkshire form, which we reproduce. It is of interest in that it relates to Thomas Edmondson, inventor of the standard railway card ticket (April, 1837), the dating press (August, 1837), the inverted ticket rack, and many other ticket devices now widely used. The Manchester & Leeds Railway (afterwards Lancashire & Yorkshire Railway) was the first to adopt the system extensively. Edmondson joined the staff of the M.L.R. in 1839 to introduce his ticket system, but left in 1842 to become a contractor for the supply and maintenance of the equipment under licence. The above form concerns this period and its date is almost certainly 1849.

LANCASHIRE AND YORKSHIRE RAILWAY

No.

Station 18

When your Dating Press, Type, or Ribbon is out of order state below what is the matter with it, and forward this memorandum to Mr EDMONDSON, Cottam Street, Manchester, and wait for instructions respecting it

Clerk in Charge

British Railways Easter Publicity

Even Better News!
FULL TRAIN SERVICES BACK TO STAY!
British Railways are glad to announce the resumption of normal train services. As already advertised, all the principal main line trains and connecting services will be running over Easter. From 29th March most of the other trains, including excursions, withdrawn because of the fuel crisis, will also be restored. Seats can be reserved on most trains starting from main departure stations — booking fee 1/-.
JOLLY GOOD SHOW BIFF!
INDUBITABLY BUFF!
BRITISH RAILWAYS
EASTER PARADE
with Summer in view
Heigh-ho!—Summer is icumen in, or it will be very soon, and now is the time to make arrangements about your holiday. Are you planning to go away for a week or more? Or are you staying at home and taking day outings? Whichever is your choice, British Railways have many special facilities waiting to increase your enjoyment and save your pocket. A brief summary of some of the good things in store for you is given below. For details of these and many other special travel facilities, please enquire at your local station or travel agency.
PARTY OUTINGS
Let British Railways make all your party arrangements for that day outing. Seats reserved, meals en route, sight-seeing tours — and you all travel at specially reduced fares. A minimum of eight adults makes up a party — and there is no maximum. Organisers of any type of outing will find full details in the free booklet 'Party Outings'.
HOLIDAY GUIDES
Five exciting holiday guides (one for each area of Britain) to help you choose your holiday resort. Each contains over 300 pages, packed with photos, descriptions and information about hotels, etc., where to stay. On sale at Railway bookstalls — price only one shilling each.
RUNABOUT TICKETS
Enjoy unlimited sight-seeing over a wide area at an extremely reasonable cost. Holiday Runabout Tickets are issued in selected districts from May to October. Each ticket allows for five to seven days unlimited travel. When you arrive at your holiday haunt, ask about them at the station.
CIRCULAR TOURS
If you like to roam, then Circular Tour Tickets will bring you pleasure — at reduced fares. They are available for three months anywhere in Britain, and include three or more point-to-point journeys. Ideal for business men as well as those on pleasure bent. Tickets are issued at approximately three-quarters the ordinary fare. Minimum third class fare 23/-.

Advertisement announcing facilities for holiday travel by rail

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Budget for 1951

The railway budget for the financial year ending March 31, 1952, introduced by Mr. P. O. Sauer, South African Minister of Transport, takes into account an expected surplus for railways and harbours for the current financial year of £6,607,000, after allowing for an appropriation of £1,000,000 to the betterment fund, and £461,000 to meet the deficiency in pension and superannuation funds. The Minister proposed to dispose of the surplus by appropriating a further £2,500,000 to the betterment fund, £1,500,000 to the renewals fund, and the remaining £2,607,000 to the rates equalisation fund.

The Minister said that the temporary surcharge of 10 per cent. on railway rates would not be interfered with pending the outcome of an investigation by a departmental committee making a thorough study of the recommendations of the Newton Committee on Railway Rating Policy. He rejected the recommendation of the Newton Committee for the appointment of a permanent rates commission to replace or supplement the Railway Board, as not being conversant with or directly concerned with general railway policy and finances.

The railways had done everything possible to meet the demands of the coalmines for wagons; the tonnage of coal hauled during 1950 (22,217,920) was considerably higher than that of any previous year. New records were also established with export manganese and chrome ore. Fertilisers, citrus and deciduous fruit, maize, meal, flour, sugar, wool and mohair, had all been conveyed in increased quantities.

The transport of base minerals was most likely to influence working results in the next financial year. Internal traffic, said the Minister, was bound to increase as a result of greater cement output, the expansion of the steel works, rapid industrial growth, and increasing coal and gold production. There was ample reason for assuming that the achievements of the railways during the past twelve months might even be surpassed in the coming year.

In the estimates of expenditure to be defrayed from revenue funds, provision is made for additional cost-of-living allowances for the staff amounting to £3,893,000. Railways and harbours expenditure at £110,067,000 for the coming financial year will exceed by £10,727,000 that for the current year.

The main expenditure figures are: railways, £101,397,000; harbours, £3,925,000; steamships, £367,000; airways, £4,298,000; and aerodromes, £80,000. It is estimated that total revenue from the operation of railways, harbours, steamships, airways and aerodromes, amounting to £111,278,000, will exceed expenditure by £1,391,000. This anticipated gross surplus will be reduced by a contribution of £750,000 to the betterment fund and £461,000 to the deficiency in pension and superannuation funds, leaving an expected net surplus of £180,000.

The estimated expenditure from capital and betterment funds for 1951-52 is £26,523,495. The estimated expenditure on railways from revenue exceeds by £9,668,000 the estimated expenditure of the previous year, and the provision on capital and betterment works exceeds by £4,035,106 the estimated expenditure from loan and betterment funds in the previous year.

TASMANIA

Bridgewater Station Gutted

Bridgewater Station was destroyed by fire on February 2. It was built less than four years ago at a cost of £A20,000, and was of weatherboard type.

By the time the Hobart Fire Brigade reached the scene, the station had been completely gutted. The Railway Department is taking action to obtain the services of an expert to replace the destroyed signalling equipment as soon as possible, and a new building of concrete brick construction is to be erected immediately.

VICTORIA

"Centenary-Jubilee Train"

A "Centenary-Jubilee Train" is on a six months' exhibition tour of the Victorian Railways and has been financed by the State Government with the co-operation of the Commonwealth Government. The ten coaches house exhibits covering the past, present, and future of Victoria and its departmental and semi-governmental activities. Included is a travelling theatrical group and an exhibit from the National Gallery of Victoria.

The train began its tour on February 1, will travel over 5,000 miles, and be open for inspection at 140 cities and towns. The coaches are painted a distinctive green with a broad gold stripe, and drawn by locomotive No. 430, Class

"Centenary-Jubilee Train" of the Victorian Railways at Spencer Street Station, Melbourne

"N," 2-8-2, built at Newport shops in 1950, and also painted green. The locomotive carries a distinctive nameboard on the front of the smokebox, and a special bell and air-ringer to announce its arrival.

CEYLON

Wooden Sleeper Industry

The establishment of a local industry for producing wooden sleepers is foreshadowed in the latest annual report of the Conservator of Forests. It is proposed to build a pressure impregnation plant for treating sleepers cut from hora timber (*Depterocarpus Lelanicus*) widely available in the wet evergreen forests.

The railway has recently found great difficulty in obtaining sleepers because of a ban in some countries on the export of hardwoods. In 1950, only a limited supply of jarrah sleepers was received from Australia. Steel sleepers from the United Kingdom and creosoted Douglas fir sleepers from Canada were imported, but the total quantities obtained still fell short of the demand.

Experiments with pressure-impregnated sleepers began in Ceylon about twenty-five years ago. The results indicated that the life of creosoted hora compared well with, and sometimes exceeded, that of the best local hardwoods, jarrah and creosoted Douglas fir.

IRELAND

Passenger Train Cancellations

Because of the shortage of locomotive coal, referred to in our March 16 issue, it has been necessary to cancel about seventy main line and suburban services from March 28.

Main line trains affected include the "Enterprise" between Dublin (Amiens Street) and Cork in each direction, also the 12.40 p.m. Dublin (Kingsbridge) to Cork and 11.40 a.m. Cork to Kingsbridge. Other important cancellations affect the Kingsbridge to Kilkenny, Dublin (Harcourt Street) to Rosslare Harbour, and Dublin, Bray, and Greystones services. Goods train services will not be cut.

SWITZERLAND

International Motorcoach Services

At a recent international conference, plans for the co-ordination of railway and long-distance motorcoach services were discussed. The conference was the result of increasing road competition, in addition to air traffic in international travel. Paralleling this development, nearly all European railways own or in some way control nation-wide road passenger undertakings. These railway-controlled undertakings decided some time ago to operate their own long-distance motorcoach services with a view to combating competition from privately-owned organisations; many international coach routes are to be created.

The co-ordination of these motorcoach services with the international railway services was discussed at the conference, also licence and financial problems. It is intended to issue tickets interavailable by railway and coach. As the Swiss Federal Railways do not themselves operate passenger road services the Swiss Postal administration handles the technical side, though in co-operation with the Federal Railways. Another development is the possible participation in international motorcoach services of certain Swiss privately-owned railways.

WESTERN GERMANY

Long-Distance Coal Traffic

The urgency of replenishing stocks exhausted during the prevailing crisis has caused much coal traffic from the Ruhr mines to South Germany to be consigned by rail instead of as usual by barge; the speed of rail transit was the determining factor, though inland water rates are only about one-sixth of rail rates.

Publications Received

The Fascination of Railways. By Roger Lloyd. London: George Allen & Unwin, Limited, Ruskin House, Museum Street, W.C.1. 8¼ in. × 5¼ in. 160 pp. Illustrated. Price 12s. 6d. net. —Written primarily for non-professional railway enthusiasts, this book contains many of the author's personal reminiscences about various aspects of railways and anecdotes of train journeys. Although much of the material has already appeared in print the matter is well presented. The pleasure derived from interest in railways is difficult to explain, says the author, but the number of people thus addicted is large and surprisingly varied.

Canon Lloyd contends that, so far as motive power is concerned, this enthusiasm applies almost entirely to the steam engine. Diesel-electrics are described as "elongated and rectangular boxes on wheels." Who will dispute this statement? Several of the day-to-day complex problems of railway operation are examined and some of the difficulties confronting timetable compilers are pinpointed. A chapter is devoted to the locomotive and there are few who will disagree with the author in his choice of photographs typifying æsthetic iniquity as applied to steam engines. Finally, there is speculation on the changes that are likely to take place in the railway sphere by 1960 and a prophecy that the steam engine will dominate the scene for another 30 years at least. The frontispiece illustration in colour shows "The Salisbury Crocodile" from an oil painting by C. Hamilton Ellis; throughout the volume there are many well-chosen photographic illustrations.

Heating Elements for Industrial Purposes. — A description of tubular sheathed heating elements and their application for industrial uses is contained in publication 7703/1 issued by the Metropolitan-Vickers Electrical Co. Ltd. This brochure contains illustrations showing manufacturing processes and infra-red equipment.

Metro-Cammell.—An abridged history of the Metropolitan-Cammell Carriage & Wagon Co. Ltd., Vickers House, Broadway, London, S.W.1, whose origin dates from the early days of the last century, recently has been published. The company was started by Joseph Wright, coachbuilder and owner of stage coaches operating between London and Birmingham, who realised that the stage coach era was coming to an end, and began the manufacture of railway carriages in London.

In 1845 the business was transferred to Birmingham and a factory was built at Saltley. From this period the history of the company has been one of continued development which culminated in the merging of the carriage and wagon building interests of Vickers Limited and Cammell Laird & Co. Ltd. into the Metropolitan-Carriage & Wagon Co. Ltd. with the object of concentrating production in the Birmingham area. In 1844, Joseph Wright obtained a patent relating to 4-, 6- and 8-wheel bogie carriages, which included features far in advance of actual practice. Samuel Fox, of Leeds Forge, amalgamated in 1877 into the organisation, pioneered the invention of pressed-steel bogies and underframes. The history also deals with the present activities of the firm.

Fan Engineering Equipment.—A third edition of brochure No. 20, published by Keith Blackman Limited, Tottenham, London, N.17, contains particulars and illustrations of a comprehensive range of the products relating to Tornado fans and blowers for industrial purposes, including air circulating and conditioning, forced draught supercharging, and so on. There are sections dealing with dust settling and collecting equipment, air heaters and filters, blowers and exhausters. Also included is a section relating to smiths' hearths and forges.

Associated Portland Cement Jubilee.—An illustrated brochure has been issued by the Associated Portland Cement Manufacturers Limited, Tothill Street, London, S.W.1, reviewing the developments which have taken place since its formation in 1900 as a result of the amalgamation of 24 cement-making companies. Other important developments took place between 1912 and 1924, including the formation of the British Portland Cement Manufacturers Limited, through a combine of a number of other cement firms, financed by Associated Portland Cement Manufacturers Limited.

XUM

Train Describers on the Southern Region

The equipment on the original colour-light sections of the Brighton line is being adopted in modernised form for the resignalling now in progress, and is widely installed elsewhere on the Region

By J. E. Mott, A.M.I.E.E., M.I.R.S.E.

THE nominal order of train running is determined by a timetable, supplemented by special notices from day to day, but in practice the order varies with working conditions. It is necessary therefore to advise the signalman of definite particulars for each train as it approaches him.

In the block system of working, the description of trains is passed on by bell code from one manually-operated signalbox to the next. When the track circuit was introduced, and automatic signalling with electrically-operated signals applied, it became possible to have a number of trains in section between signalboxes. This brought about the need for a means by which a series of trains could be "Described" to the signalbox in advance, and of storing descriptions.

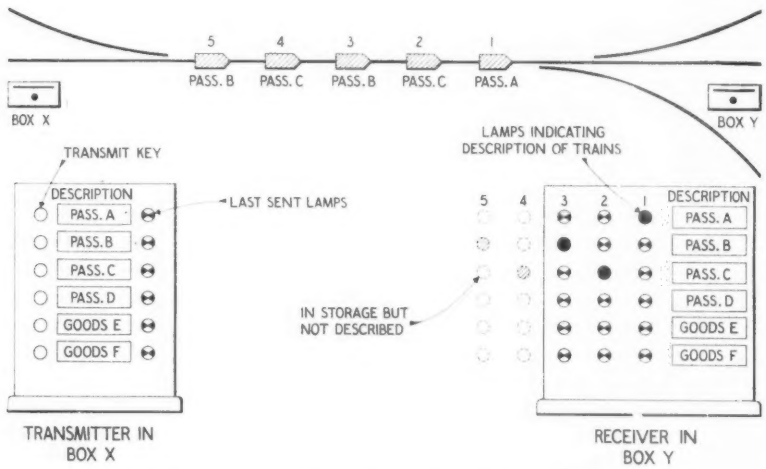


Fig. 1 Diagram of basic train describer requirements

Early Describer Device

Such a device was introduced on the Metropolitan District Railway some 40 years ago, and although reasonably successful it was predominantly mechanical and inflexible, besides requiring many line wires between signalboxes. With the growing use of automatic colour-light signalling, the importance of having an effective train describer system increased, and the solution of the problem was found by applying telephone-type equipment which forms the basis of the modern train describer.

In November, 1928, Mr. W. Challis, of the Southern Railway, read a short paper before the Institution of Railway Signal Engineers in which he reviewed the methods of train description then in use, such as the Walker and Westinghouse drum type. At the same time he suggested that a new type of describer should be devised which would require only two line wires between signal boxes, and outlined the basic requirements of suitable instruments. These requirements are illustrated in diagrammatic form in Fig. 1.

As a result of this suggestion, almost a challenge, two manufacturers undertook developments and each produced prototype equipment. This was installed between London Bridge and Bricklayers Arms, and subjected to a service test for a year or so before it was decided which system should be adopted for the Brighton line, then being equipped with automatic block sections and colour-light signals in conjunction with the electrification. Both equipments performed reasonably well, but the system developed by the Siemens and General Electric Railway Signal Co. Ltd., based on the use of telephone type uni-selector switches and relays, proved reliable and simple to understand and maintain, and was finally adopted.

Some 17 transmitters and 19 receiving instruments were installed between Coulsdon and Brighton, and they have proved of great value in assisting signalmen to handle traffic. To-day, instruments which have been modernised but using the same principles are being provided for Stages 1 to 4 of the new colour-light signalling programme between London Bridge, Victoria, and Coulsdon, the first stage of which was brought into use in October last. Fig. 2 is a location diagram showing all the describer instruments which will be in use when the scheme has been completed. Stages 2, 3 and 4 cover the area Victoria-Norwood-Coulsdon.

Simplicity of Equipment

An interesting feature of the application of train describers on the Southern Region is that, although modern developments would permit the automatic operation of describing instruments from track circuits, and so on, to follow train movements, it has been decided to adopt the policy of using simple equipment on the lines of that originally introduced. The choice is between having simple equipment which requires a signalman to make certain push-button operations, or a more complex equipment to fulfil automatically the re-transmitting and transfer operations. Train-describing equipment is provided to assist the signalman in his task of controlling train movements, and the question is to decide the degree of assistance which can be provided most economically.

The method used on the Southern Region Brighton line installation is to have a terminal transmitter at each sending signalbox and an associated terminal receiver at each succeeding signalbox. Thus, a description transmitted from the terminus remains displayed on the receiver until the train arrives, when the signalman sends the same description forward on a separate transmitter to the next box. In certain circumstances the description is forwarded before the train arrives. This process of receiving and transmitting afresh continues as the train proceeds on its journey. When trains start from boxes *en route*, the signalman is able to interpose suitable descriptions.

Train Description

Each transmitter consists of a transmit key with associated indication label and "last sent" lamp for each description. The signalman describes a train by pressing the button adjacent to the appropriate description, and as soon as transmission has been made the "last sent" lamp glows as a reminder to him of the last description he has sent forward.

It is a feature that only two wires are required between each transmitter and receiver; the multiplicity of descriptions is sent by means of electrical impulses, using a different number of impulses for each description. For example, for the description No. 1 Brighton Fast, one electrical impulse

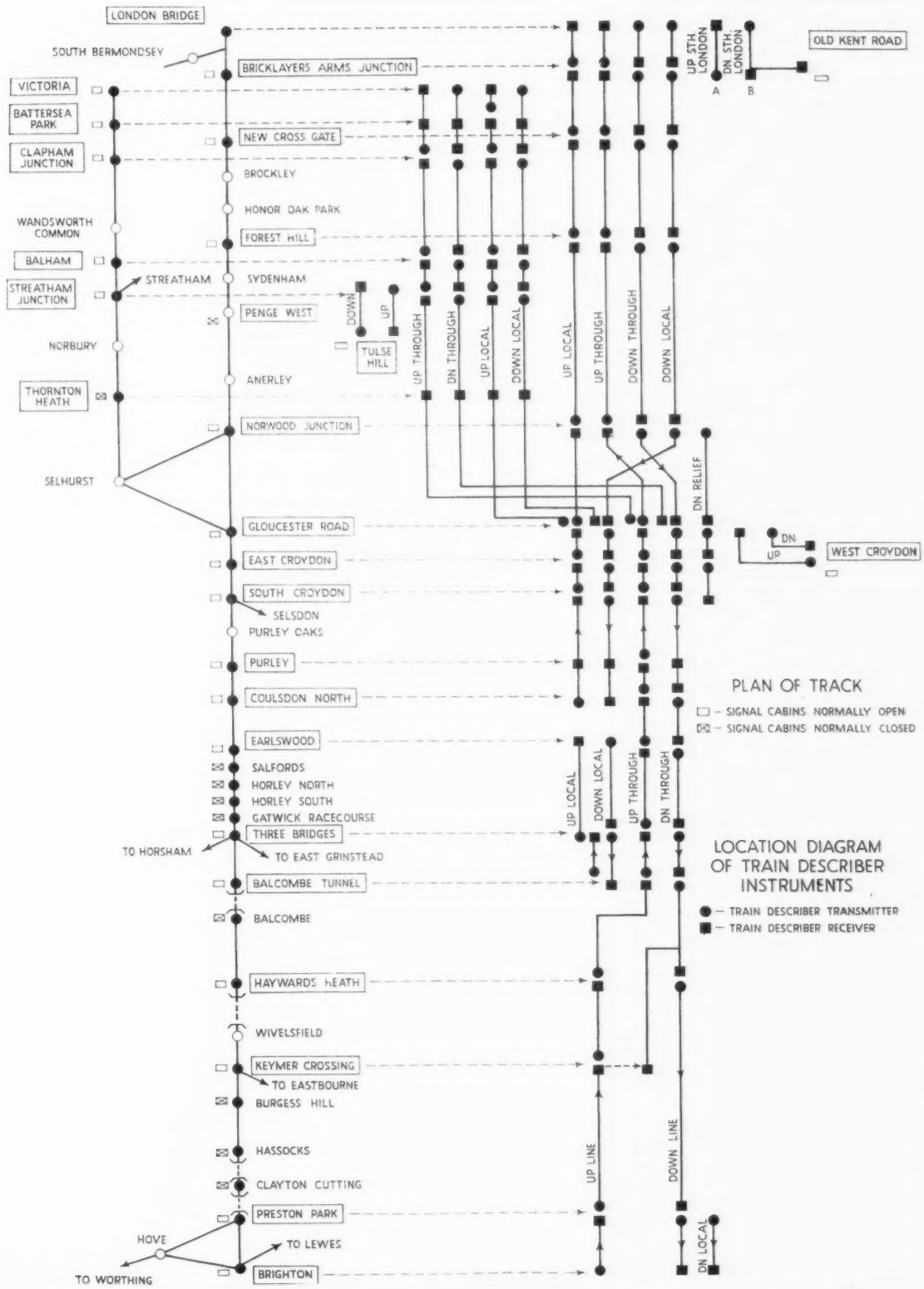


Fig. 2—Location diagram of train describers, London to Brighton, showing existing instruments and those to be installed in subsequent stages

might be sent; for No. 2 Brighton Slow, two electrical impulses and so on.

At the receiving signalbox, corresponding descriptions are displayed on a receiver indicator, three columns being provided for 1st, 2nd and 3rd trains respectively; additional storage is provided in the control equipment to accommodate the maximum number of trains which can be in section. When the first train displayed is cleared off by the signalman depressing a clearing key, the description in the second train column steps up to the 1st, the 3rd display to 2nd, and a 4th, if in storage, steps into the 3rd position.

Figs. 3a and 3b illustrate a complete equipment consisting of a transmitter and its separate control apparatus unit which is located in the sending cabin, and a receiver indicator and its separate control unit which is fixed at the receiving end, the link between the two equipments being two line wires, one of which may be common to other instruments if desired. The control equipment operates from a 50-volt supply which is obtained from secondary batteries charged from constant voltage rectifier units.

Large numbers of these instruments are also in use on other sections of the Southern Region, including Waterloo, Hampton Court and Victoria. At Waterloo, special instruments are provided to deal with movements over con-

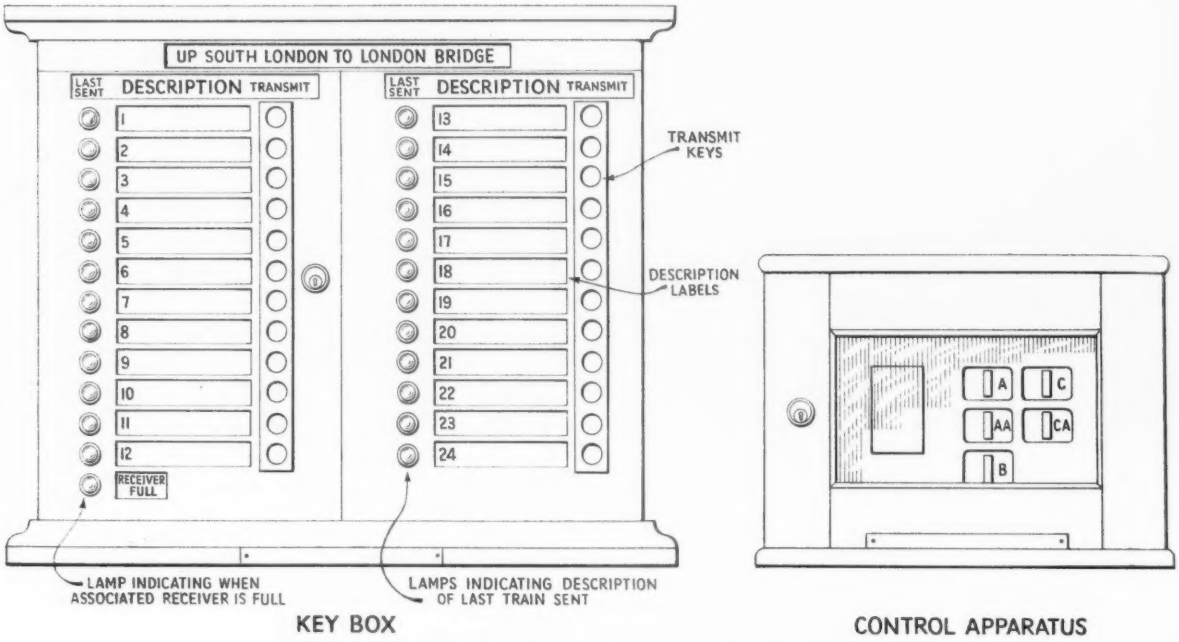


Fig. 3a—Transmitter and control apparatus in sending signalbox

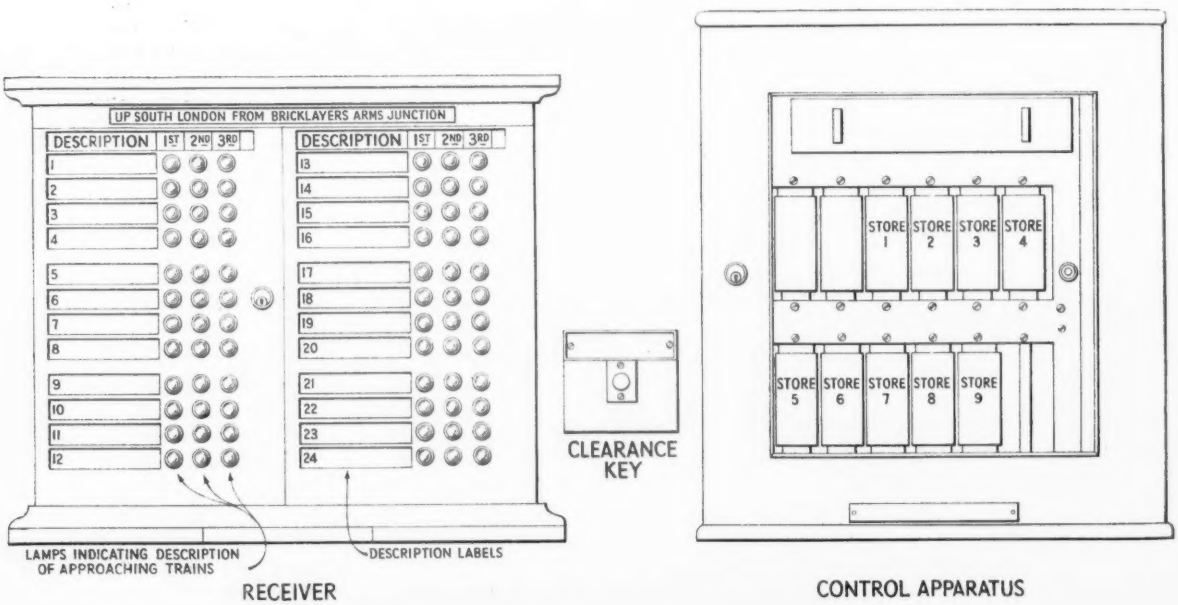
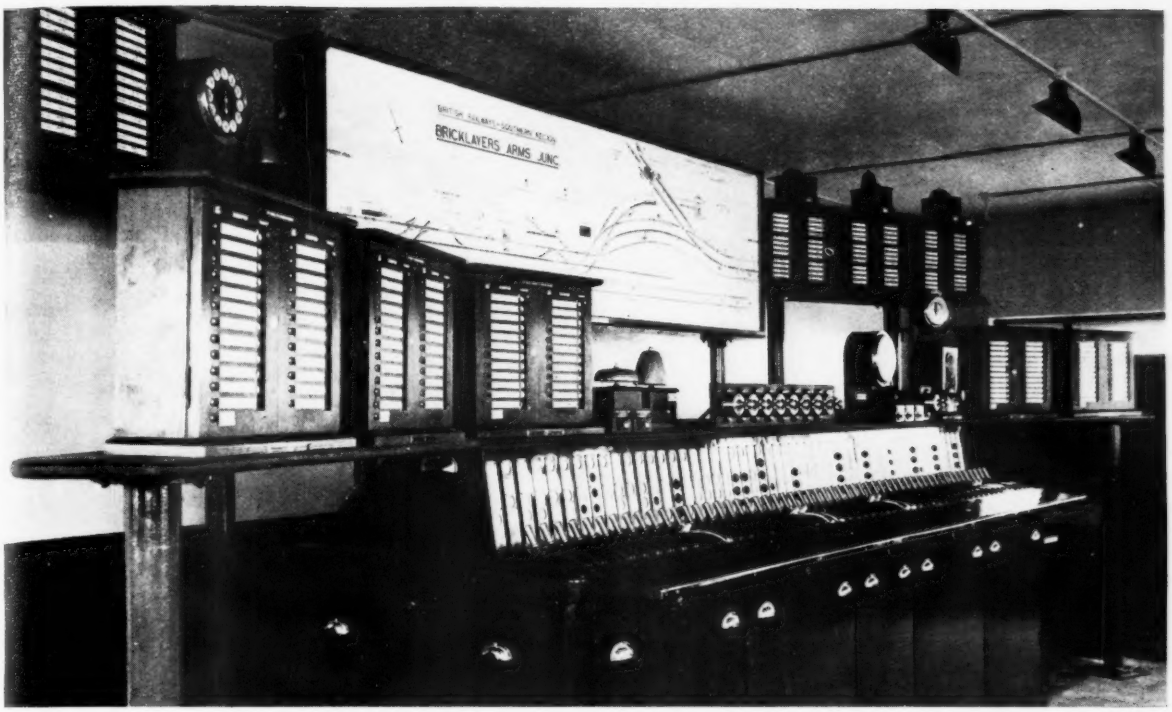


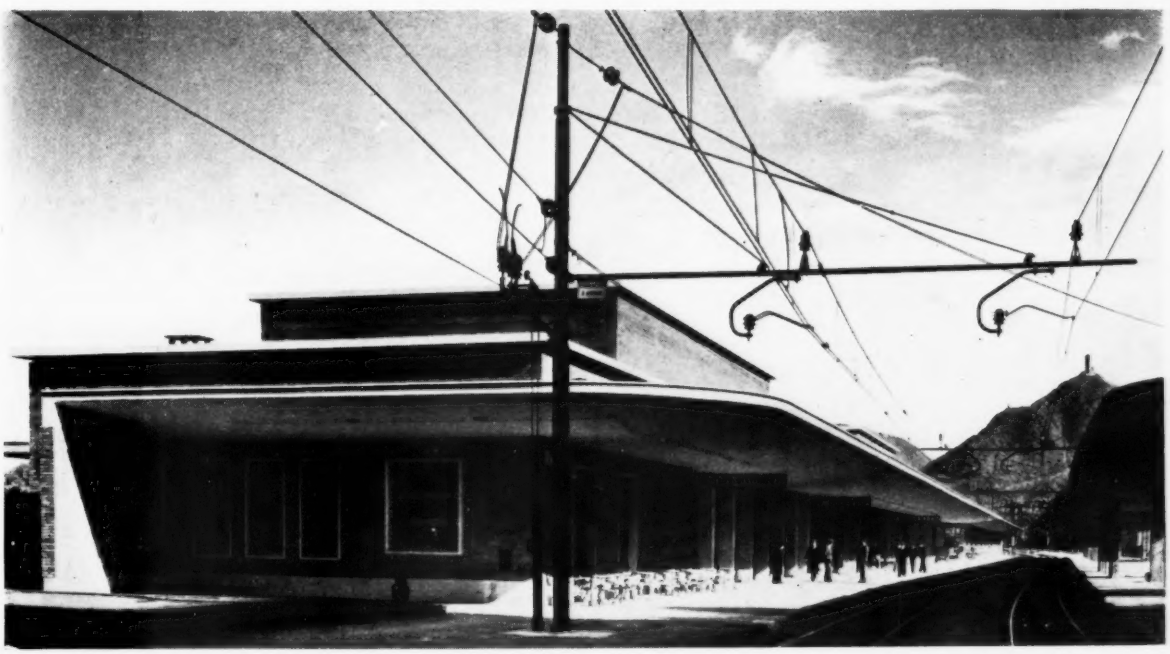
Fig. 3b—Receiver and control apparatus in receiving signalbox



Groups of S.G.E. train describer transmitters and receiving instruments which have been installed in the new signalbox at Bricklayers Arms Junction, Southern Region

verging and diverging tracks and also for the working of locomotives from the sheds into the terminus. The simple characteristics of the equipment have been maintained throughout all these installations, at the same time meeting the requirements of the intensified traffic over the respective sections of line.

Modern Italian Station Architecture



Post-war station at Camo, Italian State Railways, on the Gotthard route between Switzerland and Milan

XUM

Condensing Tender for South African Railways

Experiments with locomotive equipped with plant for using exhaust steam

ON some sections of the South African Railways the supply of water for locomotives has become a serious problem, aggravated by increasing traffic. It is often necessary to pipe water long distances to places where supplies are scarce, and seasonal failure of certain sources of supply involves tanking, which is costly and reduces line capacity.

Just before the war, in an endeavour to reduce water consumption, consideration was given to trials of condensing equipment, but there was no development until some two years ago when it was decided to order from Henschel & Sohn, G.m.b.h. Kassel, Germany, such equipment for one locomotive for extended trials. In May last, a condensing tender, with its associated locomotive equipment, was delivered for fitting to Class "20" locomotive No. 2485 at Pretoria.

The firm of Henschel & Sohn supplied the first locomotives with this system of condensing to Argentina in 1931, and Russia, in 1933. Six more were supplied to Argentina in 1936, and one condensing tender to Iraq, in 1939. Since 1942, 200 condensing locomotives were built for the German State Railways and were used extensively by the Germans during the campaign in Russia.

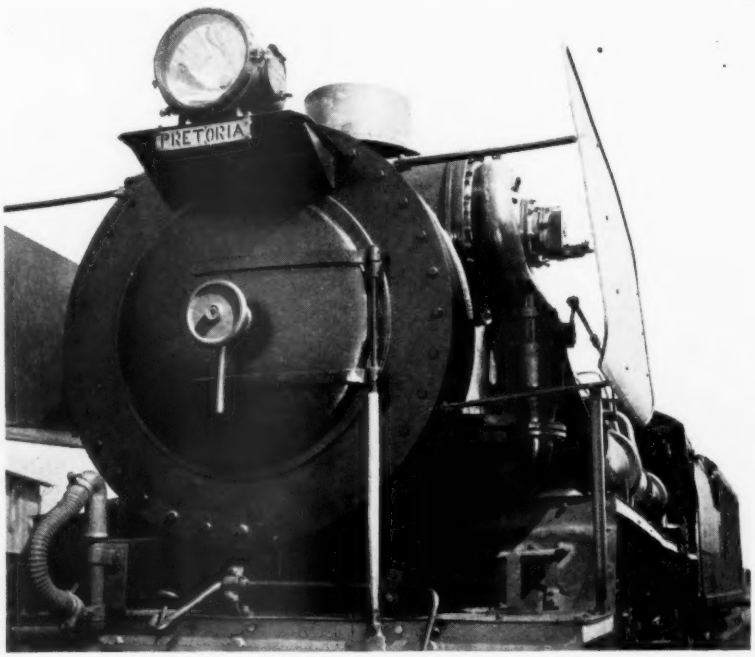
The equipment now on trial on a Class "20" 2-10-2 locomotive is designed for use also on Classes "19D" or Class "24." It is rated to cope with the maximum evaporation of the boilers of these engines at an atmospheric temperature of 110 F. in the shade.

Circulation of Steam

The exhaust steam of the locomotive is passed through a turbine mounted on the left of the smokebox. This turbine is coupled to a centrifugal blower in the smokebox, which creates the draught for combustion and ejects the gases of combustion through the chimney, and thus serves the same purpose as the jet of exhaust steam passing through the chimney of the orthodox locomotive. As in the orthodox locomotive, draught regulation is automatic, as the turbine speed varies with the quantity of exhaust steam and hence with the steam demand on the boiler.

From the exhaust turbine the steam is led through an oil separator on the left running plate of the locomotive to the condenser fan turbine on the tender. Steam from the headlight generator turbine exhaust, and from one safety valve, set 5 lb. per sq. in. lower than the other, is also led into the main exhaust steam pipe to the tender. From the condenser fan turbine, the steam passes into the condenser, the condensate gravitating into a hot water tank, from where it is pumped back into the boiler by turbine driven pumps. The exhaust from these pump turbines is also passed into the condenser.

The condenser unit is mounted behind the coal bunker on the tender. The condenser consists of two banks of gilled tubes, one on each side of the tender, forming two sides of a compartment which is closed at the front and back and provided with a roof with three circular openings in which are mounted 87-in. diameter fans. By means of these fans air is drawn in from the sides past the gilled tubes and expelled through the roof of the condensing compartment.



Class "20" locomotive showing exhaust blower turbine on left of smokebox, and special smoke deflectors

The air passing the gilled tubes extracts the heat from the exhaust steam in the tubes, causing condensation.

The tender is provided with a 3,300-gal. capacity tank for water to make up for losses due to slight and unavoidable steam leaks, steam heating in winter, operation of the vacuum brake ejector, and ashpan flushing and coal watering. The hot water feed tank is refilled from the reserve tank as and when necessary.

The trials of locomotive No. 2485, fitted with this tender, have given promising results so far. They indicate that, under average operating conditions, the locomotive is capable of doing about 400 miles without taking water. When it is pointed out that watering stations for average conditions of locomotive working must be provided about 40 or 50 miles apart, the possibilities of condensing will be apparent.

Although some additional controls and instruments are provided, operation of the locomotive is simple. Little instruction is required to enable locomotive crews to operate condenser-equipped locomotives. A feature of this locomotive is the absence of the sound of the exhaust of the orthodox steam locomotive.

Much investigation in connection with the operation of this condensing equipment remains to be done. Certain changes which may effect further saving of water are to be tried out; tests are still to be conducted under the worst conditions of summer heat, and the economics of this system of working fully investigated.

The foregoing information has been based on an article in our contemporary, *South African Railways & Harbours Magazine.*

RETURN OF ROLLING STOCK TO GREECE.—Talks are taking place between Greece and Jugoslavia for the return to Greece of Greek rolling stock now in Jugoslavia, either taken by the retreating German army in 1944, or which remained in Jugoslav territory at the outbreak of military operations in 1941.

Condensing Tender for South African Railways

Class "20" locomotive fitted with condensing tender for experimental purposes

Locomotive No. 2485 showing main exhaust steam pipe to tender

XUM

Improving the Semmering Line, Austria

Engineering and operating problems on a trunk line in the Eastern Alps

THE Semmering line, which links Vienna with Styria, Carinthia, Trieste, and Italy, is the oldest trunk line in mountain country on the Continent, having been built between 1848 and 1854. The mountain section is 26 miles long, between Gloggnitz and Mürzzuschlag. From Gloggnitz southwards to the summit in the centre of the main Semmering Tunnel, the line rises 1,480 ft. in only 18 miles, the maximum gradient being 1 in 40 between Payerbach and Eichberg; between Gloggnitz and Semmering there are 11 major viaducts and 16 tunnels, and stretches where the line is on ledges cut into the mountain. Viaducts are all of stone arch construction; several are double-tiered because of their height.

The whole line has from its inception been double-track. Beyond Semmering, the line falls 720 ft. in eight miles to Mürzzuschlag, the falling gradients on this section varying between 1 in 42 and 1 in 70.

New Tunnel Imperative

Since its completion in 1852, the Semmering Tunnel has suffered from constant water seepage and consequent damage by frost. Though heavy repairs have subsequently been carried out, it was realised in 1947 that more drastic action would soon be inevitable, and it was decided to construct a new single-line tunnel parallel to the existing one, and convert the latter to a single line tunnel. Borings and other investigations are in hand.

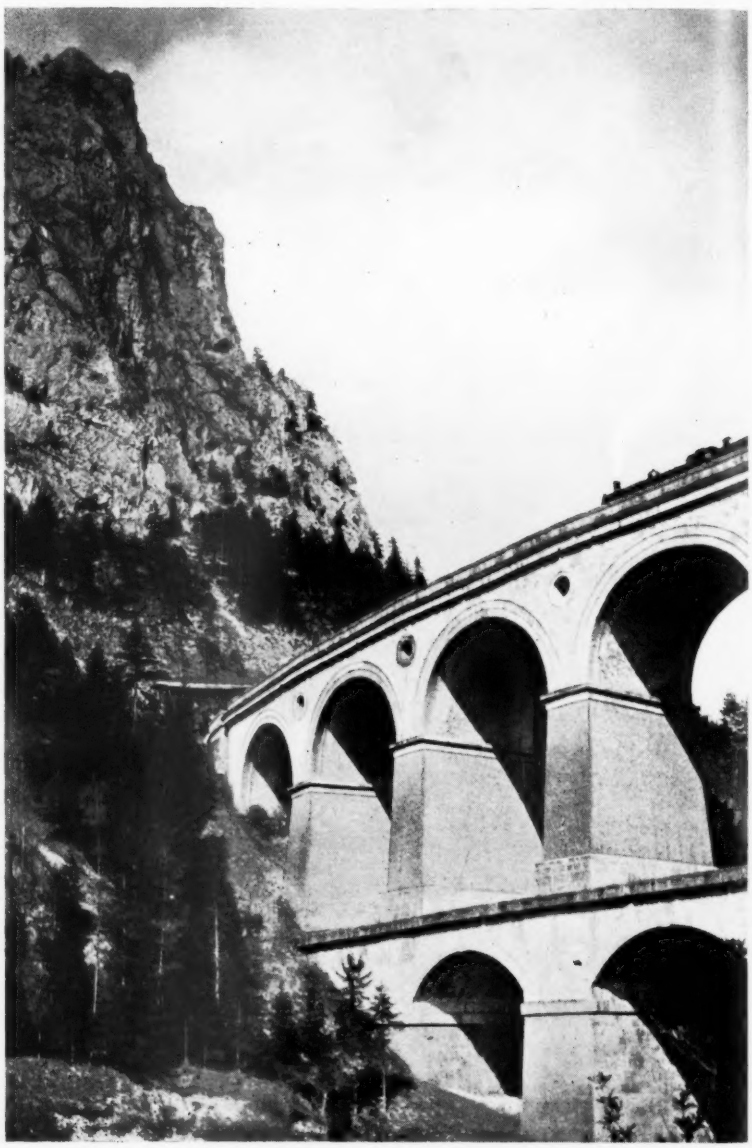
The first consideration in selecting the alignment of the new tunnel was the immediate proximity of its north portal to Semmering Station. Topographical considerations ruled out a removal of the station further northwards; it was essential to interfere as little as possible with the existing layout. The north portal therefore had to be sited only 37 ft. from the old tunnel, despite the consulting geologist's advice that the minimum axial distance between the two should be 150 ft. At the south end also the distance at the portal will be only 65 ft. In the middle, the tunnels are to be 318 ft. apart.

It was also decided to abandon the proposal for simultaneous tunnelling from adits at intermediate points. Interference with double-line traffic through the existing tunnel will therefore be avoided. Although work on the new tunnel is thus restricted to two headings, the resulting estimated construction time of 26 months is not regarded as excessive. The headings should, therefore, meet at the midway point which will also be the summit of the line, with a gradient of 1 in 250 on either side. The total length of the new tunnel will be 4,865 ft., 174 ft. more than that of the old tunnel.

The Semmering line is at present steam-worked, but the new tunnel dimensions allow for electric overhead-transmission and leave an additional margin for out-of-gauge loads. The cross-section is oval, the crown being 6·1 m. (20 ft.) above rail level, and the maximum width 6 m. (19 ft. 8 in.) at a height of 2·2 m. (7 ft. 2½ in.) above rail level. Allowance is also made for steel rib reinforcement, should this ever prove necessary. The thickness of the arch will vary between 50 and 80 cm. (19½ in. and 31½ in.), according to the rock formation encountered. The invert, where needed, will have a maximum thickness of 70 cm. (27½ in.).

Because of the close proximity of the new and old tunnels at the northern end, it has been found necessary to reinforce heavily in concrete the flank of the old tunnel for a length of approximately 130 ft., to allow for the expected lessening of the earth support. The reinforcement is being constructed by the cut-and-cover method, in sections 3 m. (9 ft. 10 in.) long. At the same time, the old retaining wall leading up to the northern portal is being replaced, section by section, by a new portal further back.

At the southern end, the first work, now being undertaken, is the diversion



The Kalte Rinne Viaduct, with a maximum height of 144 *ft.*

of the Semmering road and the removal of a retaining wall to make room for the new tunnel portal.

The method of tunnelling, which will partly depend on the exact nature of the rock encountered, has not yet been decided. Where possible, preference will be given to the Kunz method, in which the earth above the tunnel excavation is temporarily supported by the transverse steel spans which will carry the concrete shuttering.

Other Renovation Works

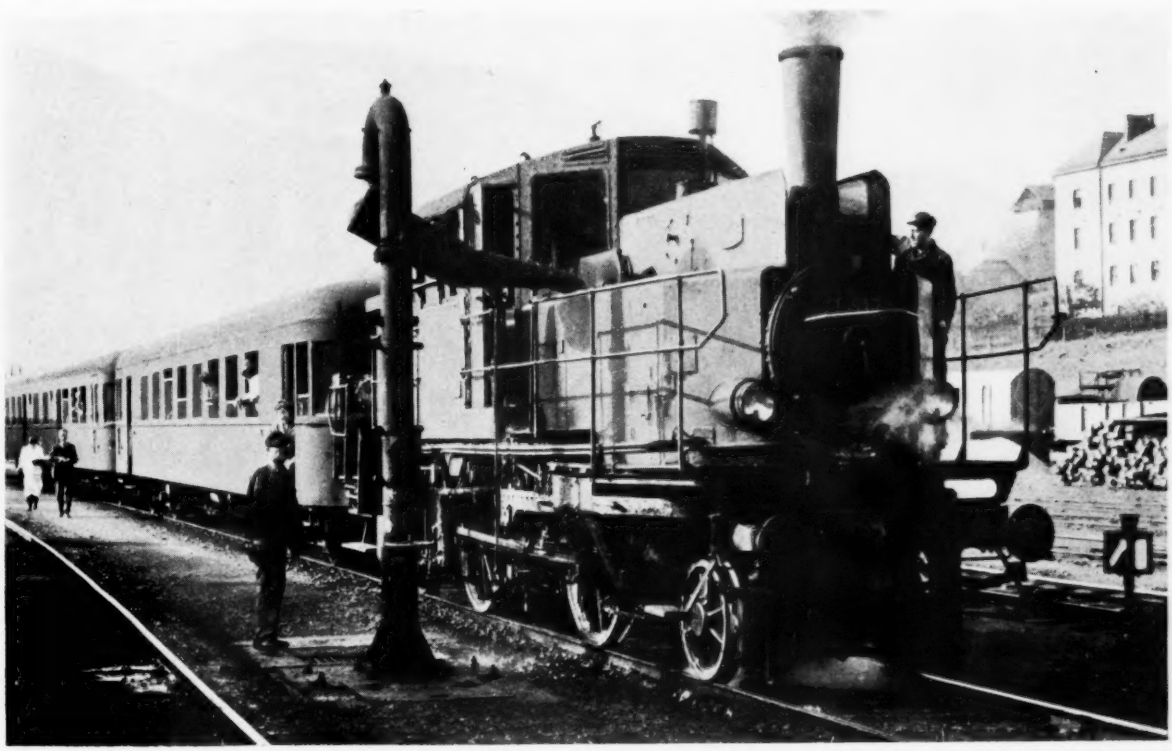
In addition to these major works at the main Semmering Tunnel, lesser renovation works are in hand in other tunnels, and at a few viaducts. The Schwarza viaduct, the longest (720 ft.), though not the highest on the line, is undergoing repairs to its deck and certain of its arches; this work is being carried out under traffic, but single-line working and a very severe speed restriction have been necessary.

From the operating standpoint, the line has presented many problems. All except the lightest trains have to be banked, northbound from Mürzzuschlag to Semmering, and southbound from Gloggnitz to Semmering. Permanent speed restrictions are at present supplemented by temporary restrictions necessitated by the poor condition of the track and by the engineering works referred to above.

Electrification of the Semmering line is planned; the Austrian Government recently announced that it intended using much of its Marshall Aid allocations for further electrification of the Austrian Federal Railways, including not only the Semmering mountain section, but the whole line throughout from Vienna to Klagenfurt and Villach.

A map of the Austrian railways, showing existing and proposed electrification, appeared in our April 25, 1947, issue.

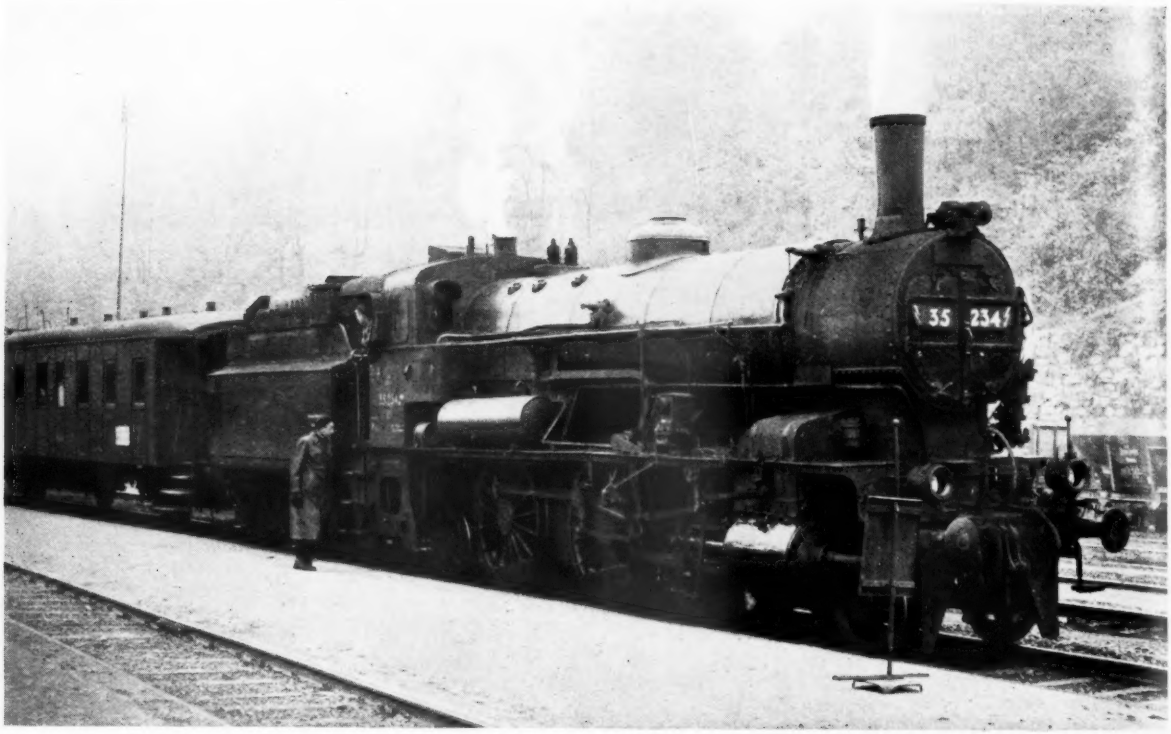
Kalte Rinne Viaduct and entrance to Bollerswand Tunnel



Graz-Vienna train at Mürzzuschlag, hauled by 2-4-2 well-tank locomotive

Photo] *[John L. Buckland*

Locomotives on the Semmering Line, Austria



Local train at Leoben, hauled by 2-6-2 locomotive, Austrian Federal Railways

A 2-12-0 locomotive used mainly for banking goods trains from Mürzzuschlag up to Semmering

Photos] [John L. Buckland

RAILWAY NEWS SECTION

PERSONAL

Mr. Cesare Lucchini, President of the General Management, Swiss Federal Railways, is retiring, and will be succeeded by Dr. H. Gschwind, General Manager (Legal & Commercial).

Mr. J. Briggs, O.B.E., M.I.C.E., Civil Engineer, London Midland Region, who, as recorded in our January 12 issue, is retiring on April 30, is the eldest son of the late Mr. J. Briggs, C.B.E., sometime Engineer-in-Chief of the Midland Railway, and himself joined the Chief Engineer's Department of the same railway in 1908. In 1912 he was appointed an Assistant to the Western Divisional Engineer. In October, 1914, Mr. Briggs was commissioned in the Royal Engineers, and in the next year went to France, where he remained until March, 1919, engaged on military railway constructional works. He was promoted Captain in 1916 and Major in 1918, and was mentioned in despatches. He returned to the Midland Railway in 1919, in the New Works Section, Chief Engineer's Department, and in 1920 was appointed Southern Divisional Engineer. He continued in a corresponding position under the L.M.S.R. until 1928, when he was transferred to Bangor as District Engineer, North Wales. In 1935 he became Senior Assistant (Permanent Way) to the Chief Engineer, L.M.S.R., and in 1937 was appointed Assistant Engineer (Permanent Way). He was made Assistant Engineer in 1945, and Assistant Chief Engineer in 1947. Mr. Briggs became Civil Engineer, London Midland Region, in 1948. He is a Lt.-Colonel in the Engineer & Railway Staff Corps R.E. (T.A.). Mr. Briggs received the O.B.E. in the King's Birthday Honours List, 1949.

Dr. J. F. C. du Toit, Deputy Railway Health Officer, South African Railways, has succeeded Dr. C. G. Booker as Railway Health Officer.

Mr. K. B. Mathur, Chief Operating Superintendent, East Indian Railway, has succeeded Mr. B. B. Varma as General Manager of that Railway.

Mr. J. Taylor Thompson, M.C., M.I.C.E., J.P., Civil Engineer, North Eastern Region, who, as recorded in our January 12 issue, has been appointed Civil Engineer, London Midland Region, as from May 1, received his early training on the N.E.R. at Newcastle-on-Tyne. He was later engaged principally on new works and was intimately associated with the schemes for developing the coal-shipping facilities on the North-East Coast. After the war of 1914-18, during which he was in command of a Royal Engineers' Section attached to the Artillery, he carried out underpinning work on the foundations of the High Level Bridge at Newcastle, and other works in the Newcastle area. He moved to York in 1925 as Personal Assistant to the Engineer, and was later Assistant to Engineer, when he was concerned with matters of organisation and with new works, including the widening of the main line between York and Northallerton and the new inward goods yard at Hull. He was appointed District Engineer, Darlington, in 1935, and at the end of 1936 became Assistant Engineer, North Eastern Area. In 1942 Mr. Taylor Thompson was appointed Engineer, York, and he became Civil Engineer, North Eastern Region, British Railways, in 1948. He was Chairman of the Yorkshire Association of the Institution of Civil Engineers in 1939-40 and on two occasions was awarded the Trevithick Premium of the Institution—for papers on high speed track and on the layout of locomotive depots. During 1948 and 1949 he was President of the Permanent Way Institution.

Mr. R. C. Johnston, formerly Assistant Vice-President, Personnel, Canadian National Railways, has been appointed Assistant Vice-President of Operations, with particular duties relating to organisation and special matters. Mr. Johnston has been succeeded as Assistant Vice-President, Personnel, by Mr. W. M. Armstrong, who since 1942 has been General Manager of Canadian National Telegraphs. Mr. J. R. White, Chief of Commercial Operations, has become General Manager of Communications, by which name the telegraph department will now be known.

Mr. J. Briggs

Civil Engineer, London Midland Region, who is retiring on April 30

Mr. J. Taylor Thompson

Appointed Civil Engineer, London Midland Region, as from May 1

XUM

Mr. T. H. W. Cruddas

Works Manager, Shildon, North Eastern Region, who has retired

Mr. W. Vandy

Appointed Works Manager, Shildon, North Eastern Region

The late Mr. H. G. Sayers

Operating Superintendent, Scottish Region, 1948-51

Mr. T. H. W. Cruddas, M.B.E., A.M.I.Mech.E., Works Manager, Shildon, North Eastern Region, who, as recorded in our March 9 issue, has retired, was apprenticed in 1905 at the Elswick Works of Sir W. G. Armstrong, Whitworth & Company. After serving in various departments, he specialised in drop stamping, forging and constructional work, and was appointed foreman in 1912, when that company was building all classes of warships, ordnance and mobile equipment. As Works Manager he turned his attention to the motor industry and general engineering after the 1914-18 war, and subsequently went to the English Steel Corporation. In 1928 he joined the L.N.E.R. at Doncaster Works and six years later was appointed Assistant Works Manager at Shildon Wagon Works, where he immediately studied, designed and formulated plans for the construction of steel wagons on mass production lines. Mr. Cruddas was appointed Works Manager in 1941, and during his term of office the works developed into one of the foremost in the country for the mass production of all-steel wagons. Since nationalisation he has acted as Chairman on various Committees for formulating data, which has made possible a large measure of standardisation.

Mr. A. Lane, Chief of Police, South Western Area, British Transport Commission, is retiring on March 31, and will be succeeded by Mr. W. W. Wood, Assistant Chief of Police to the Eastern Region and London Area.

We regret to record the death on March 20, at the age of 67, of Sir Thomas Sinclair Kennedy, F.R.S.A., M.I.E.(I.), a Director of Glenfield & Kennedy Limited.

Arising from an offer through the Economic Co-operation Administration for an employee from the British transport industry to obtain experience of developments aimed at improving productivity in the American transport industry, Mr. J. G. Bruce has been selected by the British Transport Commission to visit America for this purpose. Mr. Bruce, who is Production Engineer at the London Transport Executive railway rolling stock overhaul works at Acton, left for the U.S.A. on March 22, and will be away for approximately five months.

Mr. W. Vandy, Assistant Works Manager, Shildon, North Eastern Region, who, as recorded in our March 9 issue, has been appointed Works Manager, Shildon, was educated at Darlington Technical College and served his apprenticeship at Faverdale Wagon Works. Subsequently he attended Armstrong College, Newcastle, and obtained an L.N.E.R. directors' scholarship. Mr. Vandy served for a number of years in the Carriage & Wagon Drawing Offices at Darlington and Doncaster, and went to Shildon in 1941, first as Works Assistant to the Works Manager, and later as Chief Wagon Repair Shop Foreman. In 1947 Mr. Vandy was appointed to be Assistant Works Manager, Shildon.

Mr. O. H. Corble, Chief Officer (Marine), Railway Executive, is retiring at the end of this month.

Mr. C. V. Sampson, formerly Deputy General Manager, Southern Railway of Peru and dependencies, Peruvian Corporation, has been appointed General Manager, in succession to Mr. L. S. Blaisdell, who has retired.

Sir Eustace Missenden, formerly Chairman of the Railway Executive, has joined the boards of H.P. Sauce Limited and Lea & Perrins Limited.

Argentine Ministry of Transport

The following appointments have been made at the Argentine Ministry of Transport:—

Dr. E. A. Cárcamo, to be Technical Under-Secretary, in place of Colonel J. R. Zubieta.

Dr. R. F. Anundarain, to be Administrative Under-Secretary, in place of Mr. I. P. Castro.

Mr. Robert W. Asquith has been appointed Chairman of William Asquith Limited, in succession to Mr. Lewis Rhodes, who has retired from that position, but retains his seat on the board. Mr. J. D. H. Horobin, Secretary of the company, has been elected to the board of directors.

We regret to record the death on March 21 of Mr. H. G. Sayers, Operating Superintendent, British Railways, Scottish Region, who joined the former North Eastern Railway in 1907. In 1909 he was transferred to the District Superintendent's Office, Hull, and during the 1914-18 war, served with the Royal Engineers in Egypt and Palestine; he was mentioned in despatches. On demobilisation he returned to the District Superintendent's Office, Hull, and in 1923 went to Sunderland as Chief Staff Clerk in the District Superintendent's Office. In the following year he moved to headquarters at York and in 1929 was appointed Assistant District Superintendent, Sunderland. After serving as Dock Superintendent, Tyne Dock, from 1932 to 1933, he was transferred to Hull in a similar capacity. Mr. Sayers was appointed Assistant Superintendent, Southern Scottish Area, L.N.E.R. in 1937 and on the amalgamation of the Southern and the Northern Scottish Areas in 1939 became Assistant Superintendent, Scottish Area, L.N.E.R. He was appointed Superintendent, Scottish Area, in 1946. On January 1, 1948, he became Operating Superintendent, British Railways, Scottish Region. Mr. Sayers received the M.B.E. in 1943.

H. G. Sayers—An Appreciation

The death of H. G. Sayers will come as a shock to his many friends. His career was noteworthy, starting as he did on the bottom rung of the ladder, and working up to the top, through sheer perseverance, ability and leadership. During the past three years he did more than anyone to consolidate and build up a sound and efficient operating organisation in Scotland, and his results will be a lasting memorial to his tact, efficiency, and hard work. He never spared himself, and although his health had been failing recently, he never gave in. The railway service have lost an outstanding officer; his colleagues a great friend.—B. W.

Ministry of Transport Accident Report

Near Tollerton, North Eastern Region, British Railways: June 5, 1950

Colonel D. McMullen, Inspecting Officer of Railways, Ministry of Transport, inquired into the accident which occurred at 2.32 p.m. on June 5, 1950, near Tollerton, when the 12.15 p.m. up express, Newcastle to York, consisting of seven coaches drawn by Class A1 Pacific type engine, No. 60153, running at about 45 m.p.h., became derailed at a point 9¼ miles north of York and ½ mile south of Tollerton. The track had buckled under another express, the 10.0 a.m. "Flying Scotsman" from Edinburgh, which passed 15 min. earlier at about 65 m.p.h. and was damaged but not derailed. Nine passengers and the fireman of the 12.15 train were injured, but did not have to be detained in hospital.

Dislocation of Services

The train was travelling on the up main line and the position of the various vehicles after the accident can be seen from the plan on page 362. Considerable dislocation of services resulted. The weather had been fine for several days and was very hot. Visibility was good. The "Flying Scotsman" consisted of 13 vehicles, of which the last two only were damaged. The bogie solebars were badly distorted. This was particularly pronounced on the last coach, which had other damage, including breaking of the cell box.

Colonel McMullen inspected the track, which was laid in 1947 with 95-lb. rails in 60-ft. lengths, with steel keys except at joint chairs where hardwood was used, two days after, when the weather was again very hot.

Ballast was dirty, except for a length 220 yd. immediately in rear of the derailment. It was scanty, particularly at the south end of that length, where shortages, all in the boxing, amounted to approximately 30 per cent. of the ballast above bottom of sleeper level. The shoulders had been made up to 5 to 6 in. beyond the ends of the sleepers. There was practically no sign of creep and most gaps between rails were open ¼ to ⅜ in. A number of fishplates were removed for inspection and it was found that the fishbolts had not been slackened for some time and that rails and fishplates had become "frozen" together. The rails jumped slightly as the bolts were slackened and again as soon as the fishplates were struck.

General Impression

The general impression was, however, that most of the plates had been removed and properly oiled. The fishing surfaces were not always truly flat, and were deformed by "bulges" opposite the holes, in some cases pronounced and clearly the result of the metal swelling out when the holes were punched. The bulges alone had been bearing on the rails. A Hallade record taken on March 16 at 64 m.p.h. showed running to be good and the length had received 90 per cent. in the prize-lengths competition. Temperature records made at Linton-on-Ouse and York from May 30 to June 7, 1950, showed maximum shade figures of from 63 to 88° F. Maximum sun temperature was not recorded, but a surface reading of the rail temperature was taken at 2.30 p.m. on June 6 at mile post 9½ and gave approximately 105° F. there and 112° F. just inside the cutting where the accident occurred. The figure was well over 100° F. when Colonel McMullen made his visit, and the rail gaps should have been closed had the rails been free to expand.

The following instruction was issued on March 26, 1950, by the District Engineer, York, to all permanent way inspectors and gangers:—

Buckling of Track and Oiling of Fishplates

I must once again draw your attention to your responsibility concerning the avoidance of buckling of track due to heat. This matter is of vital importance and work which will minimise the possibility of buckling should be given great attention. This work includes the correct oiling of the fishplates and joints, the maintenance of correct expansion spaces, correct driving of keys and well ballasted and packed track. During very hot weather expansion spaces should be inspected and the fishbolts slackened off if it is found that the fishplates are preventing normal rail expansion. Lifting should never be carried out during exceptionally hot weather. It is within the next two or three months that cases of buckling usually occur and you should now pay particular attention to the items mentioned above so that the chances of having buckled track are kept to a minimum. Special attention should be paid to track on viaducts and on embankments where changes in temperature are the greatest.

On May 27, 1950, the District Engineer held a meeting of P.W.Is. at which this subject was discussed. The following was recorded in the minutes, sent to all inspectors:—

Buckling of Track

Inspectors were reminded that the period has arrived when buckling of track is most likely to occur, and they were instructed to pay particular attention to the items enumerated in the circular letter dated March 26, 1950.

Evidence

The driver of the "Scotsman" said he was travelling at about 65 m.p.h. and experienced a slight brake application after Tollerton; he thought it was due to pulling of the communication cord, but later realised it was being made by the guard and stopped with his engine halfway between signals U6 and U5 (see plan) when he saw him examining the rear vehicles. His fireman went back and returned saying a dynamo belt had come off. He sent him to signal U5 to telephone to the Beningbrough signalman. The guard then came up and told him he thought the loose belt must have caught in the ballast and that he had sent a message to Control to say the train should be stopped at York. He did not mention a lurch or appear unduly disturbed. The fireman generally confirmed this evidence, but said that the guard informed him he had told the driver about a lurch. He was picked up again before reaching the telephone.

The guard's statement was to the effect that he felt a slight lurch and heard a knock, causing him to drop his lunch-plate and stumble. He saw nothing unusual, but decided to stop, and his van pulled up 150 yd. beyond signal U6. Examining the rear vehicles he found the dynamo belt of the third from the rear hanging loose and cut it off. The cell box of the brake van was broken, and he showed these items to the fireman, to whom—and a platelayer later—he said he thought the trailing belt must have caught in the sleepers. He asked the platelayer, who had a bicycle and was going to examine the track, to telephone to the signalman that the train would stop at York for examination.

His train restarted after 6 to 7 minutes. He did not consider the lurch to be serious and did not mention it to the fireman or the platelayer. He denied saying to the carriage and wagon foreman at York: "I had a bad shaking and it felt as if we had been off the rails." Had it not been for the knock he would not have stopped the train. He had not realised that another train was following so closely, but had he done so would have gone back to signal U6 and told the signalman that they had struck something. The platelayer suggested inspecting the track; he did not ask him to do it.

The driver of the following train said that running over the line 2 to 3 weeks before had been good. After receiving some cautionary signal indications he sighted signal U11B at green, and passed it at 25 m.p.h., and ran through Tollerton at 35 m.p.h. After the bridge at the north end he noticed the track a short distance ahead was "kinked." He had no time to close the regulator, but made a full brake application, which hardly took effect before the engine became derailed. Although injured, he took detonators and protected the down lines, but could not get through on the telephone to the signal box. He estimated the distance to the kink at first at about 60 to 80 yd., and later 50 yd., and the lateral distortion as 15 in., but later considered it must have been much greater. The kink was like an S, going to the left and then to the right, but the fireman thought there were several kinks and the track looked like a snake.

The signalman at Alne said that at 2.13 he was informed from Beningbrough that the "Scotsman" had stopped between U6 and U5 signals; he therefore put U11B to red. When the next train was described at 2.24 he spoke again to that station and was told the "Scotsman" was on the move, and on asking Control was told to send it along the main line and not divert it. He cleared 11B therefore. At about 2.30 Beningbrough advised him to caution the train, which had only just passed, but as Tollerton box was closed he could do nothing. He did not know that anything had gone wrong until he heard of the accident.

The Beningbrough signalman noticed at 2.13 that the track circuits between signals U6 and U5 had been occupied for some time and informed Alne to hold following trains with a view to diverting them to the slow line, but at 2.21 he saw that the train was moving, and it passed him at 2.26, when he informed Control. The following train was described at 2.28 and at 2.33 a platelayer telephoned from signal U6S, slow line, saying the "Scotsman's" guard thought his train had hit something near U8, and he was going to investigate that. He informed Control and Alne, and while talking to the latter received "obstruction danger," which proved to have been sent by the stationmaster at Tollerton, who opened the box there on realising that an accident had occurred.

The carriage and wagon foreman at York said he was warned to examine the "Scots-

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man," which was reported as having struck something. He met the guard on its arrival, who appeared somewhat shaken and told him " he had been violently thrown about, and it seemed as if he had been off the road." (The guard, as already stated, denied having said this.) The examiner received the impression that something quite abnormal had occurred and examined the rear coaches. He noticed immediately that the bogie solebars of the rear brakevan were seriously distorted. Later he found that the damage was confined to the last two vehicles, which were unsafe to run and were detached.

His opinion, confirmed by that of the chief foreman, was that the damage could have been caused only by quite abnormal and very violent oscillation, but a non-technical man, such as the guard, might not have noticed it when he inspected the vehicles on the line.

The lengthman mentioned above was working between U6 and U5 signals when the " Scotsman " stopped. The guard called him and said he felt a bump near signal U8 (3,264 yd. in rear of U6) and asked him to telephone to the signalman that the train would stop at York and then examine the track. The train moved off and he cycled back to U6S (800 yd.) and passed the message to Beningbrough. Going on towards Tollerton he found the other train derailed.

A patrolman said it was very hot when he reached Tollerton on his return trip that morning. The track was in very good condition and he tightened a few keys, mostly wooden ones. Rail joints south of Tollerton were " fairly good " and it was " always a good piece of track for expansions." The gaps did not close in hot weather " at that particular place," but he had not noticed them that day; he thought his main responsibility was to keep the keys tight, but he knew he had to watch expansion in hot weather. He had not received any instructions as to special hot weather precautions, and the subject was not mentioned when he met the permanent way inspector a week before the accident; he could not remember when he last had to report any defect to the ganger.

The ganger said his section was rather heavy to maintain, but he had always been able to keep a good line and level, and had little trouble with creep. Oiling of fishplates had been completed in March, all being removed and fishing surfaces of plates and rails cleaned and oiled. (At the railway officers' inquiry he said it had been impossible to remove some plates.) He gave details of work he had done on the up main line, including lifting and packing in April and riddling ballast in May. He had received general instructions on hot weather precautions and understood them, and the permanent way inspector and chief permanent way inspector had spoken to him about them a few weeks before the accident.

Two days before the accident he had slackened off bolts and adjusted expansion gaps at the south end, and the sub-ganger had done the same at the north. He had not done this south of Tollerton as he thought the rails were expanding freely. On the day before the derailment he walked over the length and found the joints open, but it was not then very hot.

The permanent way inspector had been in charge of this district for six weeks. He considered the maintenance of the ganger's section " very good indeed " and found no defects. Oiling of fishplates was done before his arrival. He had not seen any removed and had no reason to suspect that the work had been scamped. He knew about the riddling of the ballast and later

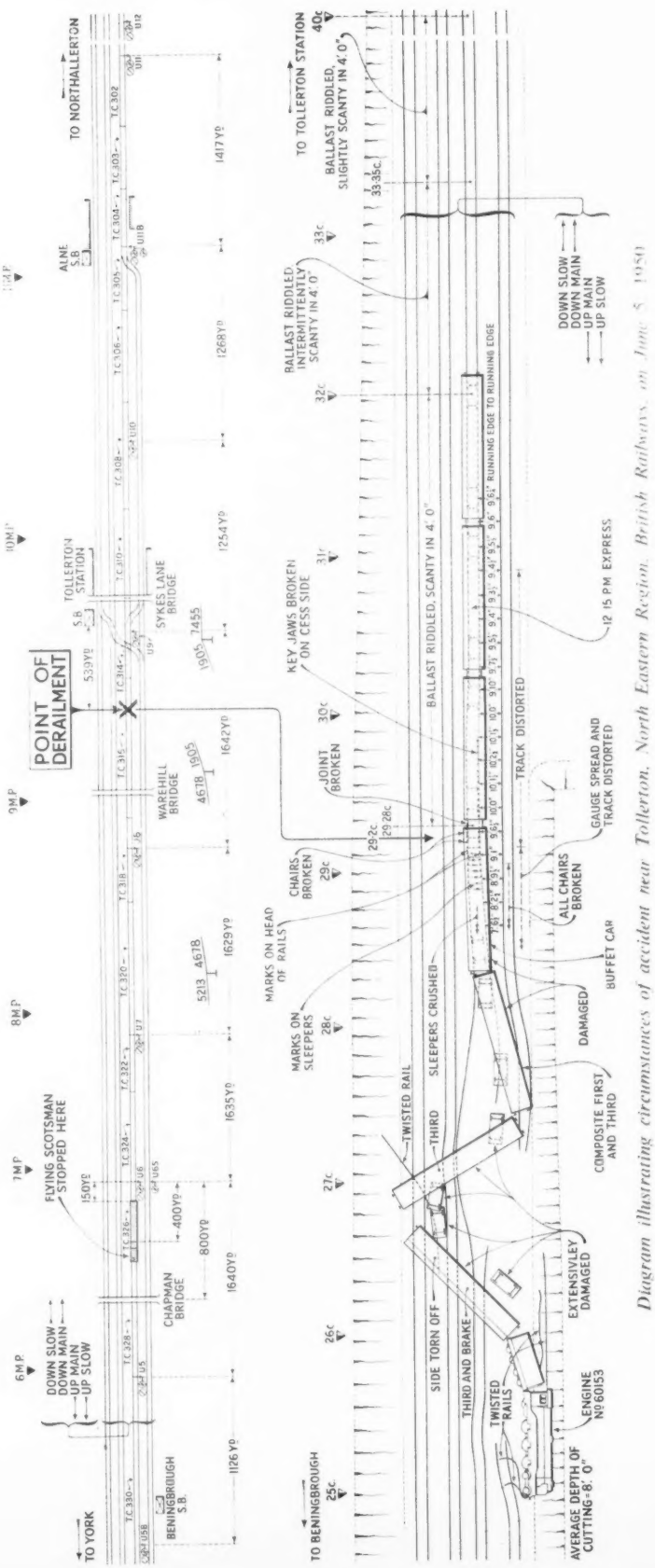

Diagram illustrating circumstances of accident near Tollerton, North Eastern Region, British Railways, on June 5, 1950

found the shoulders made up to 4 in., and ballast in the 4 ft. way short, but not dangerously so. He had not contemplated a speed restriction, in spite of the heat, but had arranged for more ballast to be supplied and to be tipped on June 6. The recent instructions about hot weather had not been sent to patrolmen, nor had special verbal instructions been given; he expected them to know their job. He thought the slackening of bolts had been done on this length.

It was part of the ordinary routine in hot weather when it was usual for rails to jump about $\frac{1}{16}$ in. when bolts were slackened, but not the $\frac{1}{4}$ in. which Colonel McMullen found in this instance. Steel keys held the rails more rigidly than wooden, but provided bolt nuts had been slackened, movement of a train over steel keyed rails would cause them to expand fully. This ganger was one of the best they had.

The acting chief inspector had checked that all gangers had received the hot-weather instruction issued in March and had understood them. Every time he met them he discussed the subject and had done so with the ganger on each of the two days before the accident. He visited when oiling was in progress and considered the gang was "making a good job of it." There might have been a few plates that were not oiled; but he did not complain of the oil, naturally it disappeared more quickly from the high spots on the fishing surfaces on which the pressure was concentrated. Ballast was somewhat short and dirty, but not so as to warrant a special supply or require a speed restriction. He considered the ganger reliable and conscientious and wished they "had a few more like him." He did not think the condition of the track responsible for the distortion and considered something must have fallen from the "Scotsman" which the derailed train hit. He agreed, however, that the fishbolts removed at the time of Colonel McMullen's inspection had not been slackened.

Inspecting Officer's Conclusions

The derailment was caused by buckling of the track as the rear coaches of the "Scotsman" passed, the rails being unable to expand and subject to undue compression. It only required the thrust and vibration of a fast train to release the locked up stresses and overcome the lateral resistance of the ballast, which was short in quantity. Its hold had been weakened by riddling, but, apart from the effects of the heat, was no doubt adequate to withstand ordinary stresses: "freezing" of the fishplates prevented the expansion, in spite of oiling, because the bolts had not been slackened. For this the ganger must be held responsible. He had received certain instructions and been spoken to on the subject. He is an experienced man and was fully alive to the fact that it had become very hot, and precautions had to be taken. He had put them into effect elsewhere on his length. It is to be regretted that he did not take similar care on what was probably, as regards ballast, the weakest part of the section. He had been in the service for 25 years, ganger for the last ten, with a clear record.

The permanent way inspector committed an error of judgment in taking the gangs from their length to work on a tamping machine on the day of the accident, the hottest one so far. It would have been more prudent first to have inquired whether all necessary precautions had been taken, particularly where he knew ballast to be weak. The guard of the "Scotsman" cannot entirely escape responsibility. The damage to the rear vehicles was such that it could have been caused only by very violent oscillation, as the guard reported to the foreman (whose statement Colonel McMullen sees no reason to doubt) and the suggestion that the lurch experienced was not serious cannot be accepted. Allowing for the fact that the guard is not technical and did not notice defects in bogies, he must have realised that something abnormal and serious had happened and should have stopped his train again at Beningbrough and advised the signalman, or gone to signal U6 and telephoned for the following trains to be cautioned. He said that if he had known other trains were following closely he would have done so. In the service for 38 years, he has been guard since 1922.

The driver of the second train might perhaps have seen the defect sooner. Had he done so the train could have been stopped or its speed appreciably reduced before it reached the damaged part of the track. Visibility was good and there was no haze; the line was straight and almost flat. From personal examination Colonel McMullen considers that the defect should have been noticeable for at least ½ mile and assumes the driver to have concentrated on signal aspects. He has a clear record as driver for ten years, and he and his fireman deserve congratulation on their prompt action, in spite of injuries, in protecting the lines. There was, as it happened, no time to stop or caution the second express, but it might have been stopped if Tollerton signal box had not been switched out.

Remarks and Recommendations

This accident, like others of a similar nature in the last few years, was mainly the result of the failure of the permanent way staff to carry out completely the instructions on the special precautions to be taken during hot weather, and a shortage of ballast contributed. The action to be taken to ensure free expansion is simple and it would appear commonsense that sections of the line on which ballast is known to be weak for any reason should receive attention in priority to others when a spell of very hot weather appears imminent. The various instructions on this subject should be amplified to make this quite clear; if action has to be delayed for any reason, a speed restriction should be imposed on weak sections until all the precautions have been taken.

The method of patrolling, with patrolmen directly responsible to the permanent way inspector, has been in existence many years and has much to commend it. Inspectors should, however, instruct on the special points to watch during hot weather and ensure that the patrolling is done with intelligence and imagination; in this case the patrolman passed over the same piece of track at the same time each day, and would therefore never observe the behaviour of the rails under heat in some parts of his section. Inspectors themselves should consider the necessity of employing lengthmen as additional patrolmen in exceptionally hot weather, and should not leave it to the initiative of the patrolmen to ask for assistance.

The inability of the rails to expand was due to the "freezing" of the fishplates to them. This condition is undoubtedly accelerated by the lack of a true surface in the fishing angles because the bearing area is reduced and the intensity of pressure correspondingly increased. More detailed examination of the fishplates in this case disclosed that in addition to the "bulges" opposite fishbolt holes, a pronounced hump also occurred at the end of the fishplates which had been sheared after rolling; also that others had a "knife edge" defect at the end of the fishing surface which might notch the rail and restrict movement. Differences up to 67 thousandths of an inch were measured between two points on a fishing table. The Railway Executive had, before this accident occurred, already begun research into this important problem. This is still in hand and it may be some time before clear conclusions are reached. It has also, for a considerable time, been experimenting with different types of lubricants and found that whatever type is used, even fishplates with true fishing surfaces "freeze" to the rails comparatively rapidly; consequently the rails will be in compression whenever a temperature rise thereafter occurs. The experiments are being continued, but the results so far suggest that the periodical slackening and re-tightening of fishbolt nuts may be necessary to maintain free movement in the joints.

Overtightening of fishbolts may also influence this question. Those removed for inspection were very tight. Excessive tightening is not only unnecessary but, indeed, undesirable. It increases pressure between bearing surfaces and squeezes out the lubricant. The issue of a shorter spanner, with less purchase, might be a satisfactory solution; on some railways spanner length is limited to 2 ft. with the very object of preventing the overtightening of nuts.

Steel keys are now in regular use and have advantages over those made of hard wood; they certainly have a stronger grip on the rails. The opinion was, however, expressed at the inquiry that when used continuously, as in this case, except at joints, they may discourage free expansion of rails. Undue freedom will, of course, allow rails to creep, but this does not entirely discount the theory, which merits consideration.

Side thrusts from rails must be resisted by the ballast. The greatest resistance is from the ballast in the bed, *i.e.*, immediately below the sleeper. But, however good the track, sleepers are inclined to rise slightly from the bed in front of an approaching train and between the coach bogies of a fast-moving train. Then any tendency to move laterally must be resisted solely by the ballast in the boxing and shoulders. Extensive experiments conducted as a result of the derailment at Wath Road in May, 1948, show the serious extent to which the disturbance of ballast reduces its resistance. They indicate also that, contrary to general belief, the ballast in the boxing contributes a greater resistance to lateral movement than that in the shoulders.

At the point where the buckling caused this derailment, the ballast had recently been disturbed, and it was deficient in the four-foot way. This accident therefore emphasises the desirability of an ample supply of ballast in the boxing and shoulders, so that the rails can be secured against all lateral thrusts, including those due to compressive stresses. The evident difficulty in ensuring that the rails can expand freely, makes this all the more important.

The accident might have been averted if Tollerton signal box had not been switched out. On long stretches of line with signals working automatically, an emergency may require a train to be stopped between permanently open signal boxes. Some means which would enable a signalman to put all signals to danger in rear of his box does, therefore, appear desirable. The Railway Executive has had this in mind, and Colonel McMullen thinks it might receive further consideration.

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Progress of Electrification in Austria

Important main-line conversions in hand

The completion in May, 1950, of the conversion of the 23-mile standard-gauge main-line section between Spittal-Millstättersee and Villach, in Carinthia, brought the total of the electrified lines of the Austrian Federal Railways to nearly 750 route-miles. Disregarding the lines of purely local importance which have been converted to electric traction, or built for electric traction from the beginning, the principal electrified lines are now:—

	Route-miles
Bregenz-Feldkirch-Innsbruck	122·3
Bregenz-St. Margreten (*a*)	8·7
Feldkirch-Buchs (*a*)	11·8
Innsbruck-Brenner (*b*)	23
Innsbruck-Scharnitz (*c*)	21·1
Innsbruck-Wörgl-Schwarzach St. Veit-Salzburg	159
Wörgl-Kufstein (*c*)	8
Schwarzach St. Veit-Spittal-Millstattersee-Villach	74·5
Salzburg-Attnang-Puchheim-Linz ...	78·24
Vienna-Berg (*d*)	38·5
St. Pölten-Mariazell-Gusswerk (*e*) ...	57·1
Attnang-Puchheim-Bad-Aussee-Steinach-Irdning	67·7
Total	670

(*a*) Connecting at St. Margreten, or Buchs, with the Swiss Federal Railways

(*b*) Connecting at Brennero with the Italian State Railways

(*c*) Connecting at Scharnitz, or Kufstein, with the German Federal Railways

(*d*) Connecting with the Czechoslovak State Railways

(*e*) Narrow-gauge railway

Conversion works in hand, as on the Vienna-Linz main line (118½ route-miles), and new conversions are to be accelerated since the rejection of the 1950-1952 investment scheme evolved by the Austrian Federal Railways; this plan, based on the supply of mineral oil to be obtained from the Zistersdorff oilfields, included the large-scale introduction of diesel traction in place of steam traction. According to a revised scheme, diesel traction will now be adopted only on minor lines.

The work on the Vienna-Linz line is being pressed forward with the aim of completing the conversion of the 39¼-mile section between Linz and Amstetten this summer. At the eastern end, between Vienna and St. Pölten, 37¾ route-miles, the work of conversion is also being accelerated.

In British-occupied Carinthia the conversion of the Villach-Tarvisio section, 17½ route-miles, is due to be undertaken this spring. It will connect the electrified Salzburg-Villach main line with the electrified Tarvisio-Udine main line of the Italian State Railways. On the other hand, it is believed that the projected conversion of the Villach-Klagenfurt-Bruck-Vienna main line (231 route-miles), and Graz-Bruck main line (33½ route-miles) will not be completed until 1955.

Current Expenditure

Expenditure for electrification in 1951 is to amount to Austrian sch. 220,000,000 (approximately £7,857,100), compared with A. sch. 160,600,000 in 1949 (about £5,735,730) and A. sch. 160,500,000 in 1950. Of the first-named amount, A. sch. 90,000,000 (about £3,214,270) is for 31 electric locomotives, an improved version of a pre-war type for both passenger and goods trains, which have been ordered from the State-owned Elin works. Four locomotives have been delivered, and at least 24 more are to be ordered this year.

With the conversion programme, the system of railway-owned water-power stations is to be extended. Of special importance in this connection is the chain of power stations now being completed in the Stubach region, in the Tauern range west of Zell-am-See, about halfway between Salzburg and Innsbruck. The first power station there, near Enzingerboden, about 11 miles south of Uttendorf-Stubachtal and 13½ miles west of Zell-am-See, was built between 1921-1929; the second, near Schneiderau, about four miles north of Enzingerboden, was completed between 1937 and 1941. The building of the third one, near Uttendorf-Stubachtal, is in hand again after having been stopped in 1944. The annual combined output of all three hydro-power stations will be 230,000,000 kWh.

The Weiss-See, in the same region, is being converted into a barrage lake with a capacity of 529,755,000 cu. ft. of water, corresponding to 25,000,000 kWh. of stored power. The capacity of the existing Tauermoorboden storage lake, also in that region, is to be increased from 741,657,000 cu. ft. to 2,295,605,000 cu. ft.

Near Braz in the Vorarlberg, on the Arlberg main line, 80 miles west of Innsbruck, another railway-owned power station is being built.

Inter-Allied Railway Club of Paris

The annual reunion of the Foyer Interallié des Chemins de Fer was recently held in Paris in the building of the Arts Club in the Rue Galilee. The Foyer corresponds to the Transportation Club in London, with the difference that, whereas the French National Railways support the Foyer, British Railways are not interested in its counterpart in London.

The evening's entertainment included dancing and an excellent cabaret show, part of which was organised by the Railway Amateur Actors Association. All the arrangements were carried out by the committee under the direction of their Chairman, Monsieur Durand.

An excellent buffet and champagne supper was provided by the popular maitre d'hotel of the Foyer, Mónsieur Charles. Some 250 guests were present, representing the transportation industry of the country.

Among those present at the reunion were:—Mr. René Mayer, Minister of Finance; Mr. C. Boyaux, Assistant General Manager, S.N.C.F.; Mr. Poncet, Chief Regional Officer, South Eastern Region; Mr. Bourrie, Chief Officer for Labour, S.N.C.F.; Mr. Ricroch, Chairman of the Régie Autonome des Transports Parisiens (corresponding to L.P.T.B.); General Mason G. Young, Colonel G. F. Heaney, and Lt.-Colonel W. A. Baker, of the American Army; Mr. Spencer, General Representative in France for the Canadian Pacific Railway; Mr. Blaser, General Representative in France for the Swiss Federal Railways; Mr. P. Durand, President of the Foyer Interallié des Chemins de Fer; Mr. Darnis-Grevelle, Secretary of the Foyer; Mr. Vidal, attached to the Secrétariat Général, S.N.C.F., who was responsible for a large part of the organisation; Mr. P. C. Durrant, General Agent for France of British Railways, and Lt.-Colonel K. R. N. Speir, Hon. Secretary of the Transportation Club.

"Nuit de la Locomotive" at the Inter-Allied Railway Club of Paris. The group in the left-hand illustration includes (centre) Lt.-Colonel K. R. N. Speir and (right) Mr. P. C. Durrant (see article above)

Staff & Labour Matters

Differentials for Running Shed Staff

The Industrial Court in Award No. 2298 of February 27, 1951, announced its decision in a claim of the employees' side of the R.S.N.C. that turners, coppersmiths, tinsmiths, and blacksmiths in British Railways locomotive running sheds be paid a differential of 6s. a week above their appropriate craft rate. In February last the court visited selected running sheds to see the work in progress.

The employees' side of the Council claimed that before July, 1922, it was the practice of the railway companies to pay the differentiated rate of 6s. a week to all craftsmen employed in running sheds, but after Industrial Court Award 728 of July, 1922 (which gave the differential only to fitters and boilersmiths) most of the companies withdrew the differential rate paid to other classes. (This was challenged before the Industrial Court in various forms and on various occasions and the Court eventually awarded that a differential of 2s. a week be paid to craftsmen concerned in the respective terms of reference.) It was a grave injustice (it was contended) that these men should receive a lesser differential rate and that there was no justification for any distinction to be made between them and fitters and boilersmiths. Evidence was given as to the duties of the craftsmen concerned, and it was submitted that in addition to the conditions under which they work in the sheds, their duties there entail more skill than in a main workshop.

The railway companies and later the Railway Executive have always contended that the circumstances of work of the men in the grades in question in running sheds are not the same as for fitters and boilersmiths, that this difference was properly recognised by the Court in their awards, and that there has been no change in conditions and duties to warrant alteration in the differentials paid.

The Court found that the claim had not been established, and awarded accordingly.

Outdoor Machinery Services Staff

The Chairman of the Industrial Court, Mr. G. G. Honeyman, published on March 6 his Award No. 2301 in a claim from the employees' side of the R.S.N.C. that Grade 1 bricklayers, carpenters, and smiths employed on outdoor machinery services work should receive an allowance over and above their normal rate. The claim arose from Industrial Court Award No. 2260 dated May 23, 1950, on a claim of the employees' side that the allowance of 12s. a week to Grade 1 fitters and electricians on outdoor machinery services work should be applied pro-rata to all classes of skilled, semi-skilled, and unskilled workers employed on that work.

The Court held that Grade 1 bricklayers, carpenters, and smiths when so employed should receive some allowance over the normal rate. The parties should assess the skill, adaptability, and qualifications required of each of these craftsmen and their responsibilities when so employed, and determine by agreement the amount of the allowances to be paid to them in relation to the allowace of 12s. a week to Grade 1 fitters and electricians. In the event of the parties failing to reach agreement within a period of six weeks, either party should be at liberty to report such failure to the Industrial Court.

On December 7, 1950, the employees' side of the Council reported to the Industrial Court that it had not been possible to reach agreement. The Court heard the parties on March 2, and awarded that the staff concerned when employed on outdoor machinery services work should receive an allowance of 8s. a week, to take effect from the first full pay period following March 6, 1951.

Questions in Parliament

Railway Revenue

Mr. P. H. Collick (Birkenhead—Lab.) on March 12 asked the Minister of Transport what was the total amount of net revenue received by the Exchequer from the operations of the railways from September, 1939, to December, 1947.

Mr. Alfred Barnes stated in a written answer: The net revenue from the operations of the railways, including the London Passenger Transport Board, after meeting the annual rental due to the controlled undertakings, was £124·5 million.

Railway Wages

Mr. Cyril Osborne (Louth—C.) on March 15 asked the Minister of Labour if he would make a statement on the recent railway wage negotiations, and whether any pressure was exerted by the Government on the Railway Executive to pay higher wages than were awarded by the independent tribunal.

Mr. Bevan: It was not a tribunal. It was a report of an inquiry, and, therefore, did not have the status of an arbitration award. The discussions between the Ministry of Labour and both sides of the industry were quite confidential.

Traffic Survey of Railways

Mr. David Renton on March 5 asked the Minister of Transport if he would make a statement as to the directions of a general character he would issue to the B.T.C. instructing it to have a comprehensive survey made of the railways so as to ascertain which railway lines were incapable of bearing the cost of operating the traffic on them.

Mr. Alfred Barnes stated in a written answer: I do not feel it is necessary for me to issue any such directions. The Transport Act places on the Commission the general duty of providing or securing or promoting the provision of an economical and properly integrated system of public inland transport, and the fulfilment of this obligation will involve questions of the type which Mr. Renton has in mind.

East Anglia Consultative Committee

Mr. S. J. McAdden (East Southend—C.) on March 5 asked the Minister of Transport what process of selection was used in appointing members to the East Anglia Transport Consultative Committee.

Mr. Alfred Barnes: As required by the Transport Act, I consulted bodies representing agriculture, commerce, industry, shipping, labour, and local authorities. From the names submitted by them and by the B.T.C. I chose the persons who appeared to be most suitable, with due regard to a proper balance within the Committee as a whole and a reasonable distribution of membership throughout the area of the Committee. I have also appointed two additional members.

Mr. McAdden: Is the Minister aware that this method of selection has entirely debarred from representation any of those who are day-to-day passengers on the railway?

Mr. Barnes: As there is a season ticket holder in every town and city it would be impossible to secure the representations of all of them. There is a season ticket holder on this Committee, but the authority (Southend) in which Mr. McAdden is interested has a direct representative put on by the municipal authority.

Railway Clerk's Appeal Against Call-up

Mr. D. Donnelly (Pembroke—Lab.) on March 14 asked the Secretary of State for Air why the appeal by Mr. F. Jacob, of Haverfordwest, against his call-up under Class "G" Reserve had been turned down, as he was 42 years of age and his job as a railway clerk was reserved at 35 during the 1939-45 war.

Mr. Arthur Henderson: The reason why Mr. Jacob's appeal had to be rejected is that the number of men in the Air Force trade of Clerk S.D. available for call-up is limited, and the grounds on which he appealed were not felt to be sufficiently strong. The arrangements which during the last war governed the call-up by age groups of men who had not previously received Service training, are not appropriate for the selective recall of trained reservists on the present occasion.

Doncaster Railway Accident

Captain R. J. Gunter (Doncaster—Lab.) on March 19 asked the Minister of Transport if he had any statement to make on the accident at Doncaster on March 16.

Mr. Alfred Barnes, after outlining the known facts of the case, and expressing sympathy with the relatives of those killed, and with the injured, said: The rescue work was carried out with commendable promptitude and efficiency by railway staff and other local organisations. An Inspecting Officer of Railways from my Department visited the site within a few hours of the accident, and a formal inquiry is being opened on March 21 at Doncaster.

Captain Gunter: I am sure the Minister's remarks on the organisation of relief work and of local organisations will be very well received in the Borough of Doncaster. It was an amazing feat of organisation and reflects the greatest credit, not only on the railwaymen who acted so magnificently, but on the local authority as well.

Mileage Coupons on British Railways

Mr. Henry L. D'A. Hopkinson (Taunton—C.) on March 6 asked the Lord President of the Council if he would arrange that special Festival of Britain facilities offered by him to overseas visitors, such as mileage coupons on British Railways, should be made available to residents of the United Kingdom.

Mr. Herbert Morrison: I do not offer any special facilities to overseas visitors in connection with the Festival.

Mr. Hopkinson: American magazines are carrying Festival of Britain advertisements which announce: "Substantial savings not obtainable in Britain," including mileage coupons, which provide for 1,000 miles of travel at 22 dollars 40 cents, third class, and weekly "Go as you Please" London Transport tickets at 3 dollars 50 cents. Is there any reason why these should not be made available to the people of this country?

Mr. Morrison: Mr. Hopkinson had better send it to me and I will have a look at it.

INSTITUTE OF TRAFFIC ADMINISTRATION: PRESTON CENTRE OPENED.—The inaugural meeting of the Preston centre of the Institute of Traffic Administration was held on March 29. Mr. A. Lawes Cole, a Vice-President of the Institute, presided.

XUM

Contracts & Tenders

An order for 209 diesel-engine bus chassis, valued at nearly £400,000, has been placed with Leyland Motors Limited, by Coras Iompair Eireann. The new vehicles will be used by C.I.E. mainly to replace obsolete or outworn machines; they will be assembled in Dublin, and the bodies are to be built at Inchicore Works, C.I.E.

The Board of Trade, Commercial Relations & Exports Department, Special Register Information Service recently stated that the British Embassy at Lisbon has reported a call for tenders issued by the Directorate of the Services of Ports, Railways and Transport of the Colony of Mozambique for the following permanent way material:—

For delivery at Lourenco Marques:
1,188 rails of 12 m. in length, weighing 30 kilos per m.;
4,646 fishplates;
4,792 bolts with spring washers;
37,616 galvanized sleeper screws;
42 complete crossovers, with all the material pertaining thereto;
22 manganese steel crossings;
100 kilos of spring washers.

For delivery at Beira:
3,334 rails of 12 m. in length, weighing 30 kilos per m.;
6,668 fishplates;
13,400 bolts with spring washers;
120,000 galvanized sleeper screws;
34 complete crossovers, with all the material pertaining thereto.

Tenders should reach the General Warehouses of the Directorate in Lourenco Marques by 3 p.m. on May 1, 1951. Tenderers when submitting their quotation must make the following provisional deposits:—

For rails—Esc. 125,000 (£1,562 10s.)
For fishplates, bolts and sleeper screws—Esc. 30,000 (£375)
For crossovers and crossings—Esc. 60,000 (£750)

The tender conditions, specifications and drawings can be inspected at the offices of the Directorate General of Colonial Development, 13 Praca do Principe Real, Lisbon; in Lourenco Marques, in the 3rd Section of the General Warehouses of the Directorate General of the Services of Ports, Railways and Transport of the Colony of Mozambique; and in Inhambane, Beira, Quelimane and Lumbo.

The British Embassy estimates that the value of the contract is about £107,500.

Notes and News

Renaming of Walham Green Station.—London Transport Executive announces that Walham Green Station is to be renamed Fulham Broadway.

Civil Engineer Required.—A firm of consulting engineers have a vacancy for a civil engineer, up to 50 years of age, in its London office. See Official Notices on page 367.

Engineer Required.—An engineer, between 28 and 35 years of age, is required by Charles Roberts & Co. Ltd., Horbury Junction, near Wakefield, to act as assistant to managing director. See Official Notices on page 367.

Great Western of Brazil Payment.—The joint liquidators of the Great Western of Brazil Railway Company announce that the court has now granted permission to make a first distribution of £7 15s. per £10 unit to the preferred and ordinary stockholders. It is expected that, provided all the formalities are completed, payment will be effected on May 9. The sale of the railway and assets in Brazil was ratified last July.

District Locomotive Superintendent Required.—The Sudan Railway require a district locomotive superintendent, aged between 25 and 35 years, for service in the Sudan. See Official Notices on page 367.

Inspection Tour by Mr. John Elliot.—The Chairman of the Railway Executive, Mr. John Elliot, recently toured the Fenchurch Street to Southend line of the Eastern Region by special train, on what is intended to be the first of a series of monthly tours of inspection. Amongst matters investigated were complaints by season-ticket holders regarding the train service.

Railway Benevolent Institution.—At a meeting on March 21 the board of the Railway Benevolent Institution granted annuities to nine widows and seven members involving an additional liability of £285 9s. a year. Forty-four gratuities were also granted amounting to £570 10s. to meet cases of immediate necessity. Grants made from the casualty fund during February amounted to £935.

Internal Air Fares to be Increased.—Passenger fares on a number of British European Airways internal services are to be increased this summer. Most of the routes affected are in Scotland and the higher fares will start on April 15. From the same date the cost of a monthly return ticket between London and Belfast and between Glasgow and Belfast will also be increased. The single and six-monthly return fares on these routes will remain the same.

Manila Railroad Proposals.—The board of the Manila Railroad is understood to have formulated tentative proposals for liquidating its debt to London bondholders on the basis of a reimbursement of 50 per cent. of the value of the outstanding bonds *plus* interest accrued since 1946. Any definite proposals would require prior approval by the commission which President Quirino appointed recently. There are outstanding bonds to the value of $13,236,000 and accrued unpaid interest (since 1941) totalling $6,287,100.

One Thousand Excursions on the L.M.R.—The London Midland Region of British Railways has lost no time in arranging attractive cheap trips following the lifting of the restrictions caused by the fuel crisis. Already 1,000 day, half-day, and evening excursions to seaside, country, and sporting events have been arranged for the next three months, and for the Festival of Britain the L.M.R. will take 250,000 people to London by 160 special excursion trains and by ordinary services at cheap fares.

Beyer, Peacock & Co. Ltd.—The ordinary dividend of Beyer, Peacock & Co. Ltd. is being increased from 5 per cent., which has been the rate for the past four years, to 7½ per cent. The bonus of 2½ per cent., which compares with 1 per cent., makes 10 per cent., less tax, against 6 per cent. The combined profit before tax for 1950 amounts to £403,909, against £285,079, and after taxation of £208,468, against £139,373, and including special credits of £13,518 (£9,743), the group net profit is £195,441 compared with £145,706.

Scottish Region Stations Closed.—British Railways, Scottish Region, has announced that as from April 2 the passenger train service will be withdrawn from the Torrance branch, and Glasterlaw Station on the Forfar-Aberdeen main line. Passenger train parcels and miscellaneous traffic will continue to be dealt with at Glasterlaw Station; and there will be no change in freight-train traffic arrangements. On the Torrance branch, Summerston, Balmore, and Torrance stations will be closed for passenger-train traffic and for freight-train traffic in less than truck loads. On April

Mr. John Elliot (left) at Southend Central with (left to right) Messrs. C. K. Bird, Chief Regional Officer and C. G. G. Dandridge, Commercial Superintendent, Eastern Region, and Mr. V. M. Barrington-Ward, Member, Railway Executive (see paragraph above)

OFFICIAL NOTICES

Sudan Government

THE Sudan Railway require a District Locomotive Superintendent, aged 25 to 35, for service in the Sudan. The duties consist of the control and administration of locomotive running depots, including the maintenance of locomotives and rolling stock and general mechanical engineering duties. Candidates must be fully qualified and locomotive engineers both in theory and in practice. They must have graduated in Mechanical Engineering from a University and/or must be corporate members of the Institution of Mechanical Engineers, must have served a full apprenticeship or pupilage on a railway or with a firm of locomotive builders of repute, and must have held a position of responsibility in locomotive engineering for not less than one year. Appointment will be either on long term contract for 12 years on a salary scale £E.617 to £E.1,055, with special post-service gratuity of £E.4,000; or on Provident Fund contract at higher rates of pay and different post-service benefits. Cost-of-living allowance varying between £E.142 and £E.352 per annum according to the number of dependents is at present payable, and, subject to certain limitations, an outfit allowance of £E.60 is payable on appointment. There is at present no income tax in the Sudan. Free passage on appointment. Further particulars and application form may be obtained on application to: SUDAN AGENT IN LONDON, Wellington House, Buckingham Gate, London, S.W.1. Please mark envelopes "District Loco. Supt.—4/35."

CIVIL ENGINEER (age up to about 50) with wide experience of design and construction of deep-water wharves and railways required for London office of firm of consulting engineers. Applications, which will be treated in strict confidence, should state full details of education, training and experience.—Write Box "119/3," c/o 95, Bishopsgate, E.C.2.

THE PERUVIAN CORPORATION LTD.—Assistant to Chief of Traction, Peruvian Railways, age 26-30; qualifications: apprenticeship with steam locomotive builders, Higher National Certificate for mechanical engineering, or graduate of Institute of Mechanical Engineers, a knowledge of Spanish an advantage.—Apply to the Secretary of the PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

GLOSSARY OF WOOD. A technical dictionary for all associated with timber and its uses. Ten thousand terms about timber—the common and the little known, the old and the new. Ten thousand definitions covering the entire field of timber and its uses—growth, marketing, utilisation. The commercial timbers, their qualities and uses, tools and woodworking equipment, are all here explained simply, concisely and accurately. Illustrated by many clear line drawings. Price 21*s.* net. By post 21*s.* 9*d.* Tothill Press Limited, 33, Tothill Street, London, S.W.1.

ENGINEER, age 28/35 years, preferably with some experience in the railway carriage and wagon building industry, required to act as Assistant to Managing Director. Applications to the MANAGING DIRECTOR, CHARLES ROBERTS & CO. LTD., Horbury Junction, near Wakefield.

INTERNATIONAL RAILWAY ASSOCIATIONS. Notes on the work of the various associations concerned with International traffic, principally on the European Continent. 2*s.* By post 2*s.* 2*d.* *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth. 8¼ in. by 5½ in. 82 pp. Diagrams. 5*s.* By post 5*s.* 3*d.* *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Method. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. Price 20*s.* By post 20*s.* 6*d.* *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

2. Curriehill Station, on the Edinburgh (Princes Street) to Midcalder line, will also be closed to all traffic.

Dinner to Mr. O. H. Corble.—At Southampton, on March 12, the members of the Railway Executive Marine Committee entertained to dinner Mr. O. H. Corble,

Mr. O. H. Corble shaking hands with Mr. R. P. Biddle after relinquishing the Chairmanship of the Railway Executive Marine Committee

Chief Officer (Marine), Railway Executive, on the occasion of his relinquishing the Chairmanship of the Marine Committee, before retirement from the railway service. On behalf of the members of the Committee, Mr. R. P. Biddle, Docks & Marine Manager, Southampton, presented Mr. Corble with a barometer.

Skefko Ball Bearing Co. Ltd.—At a meeting of the directors of the Skefko Ball Bearing Co. Ltd., on March 20, it was decided to recommend a final dividend of 7d. per stock unit of 5s., free of tax, making 10d. for the year ended December 31, 1950. In addition a special anniversary bonus of 2d. per stock unit of 5s., free of tax, was declared in December last. The balance of profit was £303,547, against £227,094, after charging: Taxation, £790,000, against £670,000; reserve for possible reductions in stock values, £250,000, against £250,000; other provisions, £40,500, compared with £49,448. Added to the balance of profit of £303,547 is the balance of provisions set aside in previous years not now required, £12,000, making available with the carry forward £465,882. Dividends and special anniversary bonus take £160,000, and transfer to general reserve £125,000, leaving £180,882 to be carried forward.

London Transport Services Restored.—Cuts made on February 8 in some railway, tram, and trolleybus services of London Transport were restored on March 22. The cuts, made to save coal, affected only non-rush-hour services.

Pacific Great Eastern Extension.—The Premier of British Columbia has informed the Legislature that the Government of the Province is now committed to extend the Pacific Great Eastern Railway from its present terminus at Squamish, to Vancouver. The railway was described in our March 24, 1950, issue.

Scottish Region Holiday Services.—The Scottish Region of British Railways ran many additional trains and steamers during the Easter and Glasgow Spring holidays. From March 22-27 over thirty extra trains left the four main-line terminal stations for Aberdeen, Oban, Newcastle, York, Leeds, Sheffield, and London, while additional trains were run on local services during the holiday period. The service to Arran was augmented by a special connection from St. Enoch Station and excursion trips by rail and steamer also were run.

Institute of Transport Congress at Torquay.—The detailed arrangements for the Institute of Transport Congress at Torquay have recently been announced. Mr. J. S. Wills, President, will open the proceedings at 10.0 a.m. on June 13 at the Imperial Hotel (the Congress headquarters) after which a civic welcome will be extended to the Congress by the Mayor of Torquay. The papers which will be presented are "Transport Costs and Charges," by Sir William Wood, Past-President, on June 13, and "Parliament and the Transport Problem," by Mr. David Renton, M.P., on June 14. The provisional programme of visits and excursions includes the locomotive works at Newton Abbot and the Devon General works at Torquay, on June 13; either the reconstruction of Plymouth and inspection of works of the City Transport Department, and the Western National Omnibus Co. Ltd., or the Ocean Terminal at Millbay Docks and cruise by tender in the Sound and Hamoaze on June 14; and Exmouth Junction works of British Railways, Southern Region, on June 15; as well as alternative visits to places of historical and scenic interest. Evening functions will include a reception by the Mayor of Torquay and the Mayoress on June 13 and a reception by the President and Mrs. Wills the following day.

Paris Transport Strike.—Although French National Railways men returned to work on Easter Sunday, Paris transport workers were still on strike on March 28. A skeleton service is being operated on the Metro. On March 26 the strike committee turned down a Government offer of a fr. 3,000 monthly increase and stood by its claim for a fr. 6,000 increase.

Model Railway Exhibition.—The 1951 Model Railway Exhibition, which was opened at Central Hall on March 27 and will be on show until Saturday, March 31, includes over 3,000 models and a variety of working layouts. Among the many distinctive models on show are a West Maryland 4-6-6-4 locomotive to 4 mm. scale, which has been built entirely from raw materials by Mr. R. A. Warboys, and a 4 mm. scale L.S.W.R. 2-4-0 well tank engine by Mr. J. H. Guarnari. A feature of the exhibition is a stand devoted to pre-grouping models in correct liveries, and among the exhibits are a North British 0-4-2 to 4 mm. scale by Mr. H. G. Kerr, and a 7 mm. scale "K" class 4-4-0 by Mr. A. B. MacLeod. An interesting layout is a Buckingham branch line designed to fit into an ordinary dwelling house where no separate room can be provided; the layout is completely portable and divides into eleven sections. British Railways are showing a number of push-button models, among which is the standard Pacific locomotive *Britannia*.

North Eastern Region Federation of Debating Societies.—At a meeting of the North Eastern Region Federation of Railway Lecture & Debating Societies at York on March 13, Sir Reginald Holmes Wilson, Comptroller, British Transport Commission, read a paper on "Comparative Costing" before an audience of nearly 200. Among those present were the following Officers of the North Eastern Region:—Messrs. H. A. Short, Chief Regional Officer, and Chairman of the Federation;

B. X. Jessop, Assistant Chief Regional Officer; E. W. Arkle, Commercial Superintendent; A. P. Hunter, Divisional Operating Superintendent; J. H. Fraser, Signal & Telecommunications Engineer. Messrs. S. A. Finnis, Chief Docks Manager, Humber Ports, and J. L. Meadowcroft, Eastern Area Superintendent, Hotels Executive, York, were also present. At the conclusion of the meeting a vote of thanks was proposed by Mr. H. F. Pallant, Assistant Divisional Operating Superintendent.

Holoplast Limited.—The firm of Holoplast Limited is again exhibiting at the British Industries Fair at Castle Bromwich. Their stand is being designed to demonstrate the use of Holoplast panels as an exterior wall, and internal partitioning in a typical office construction. The laminated plastic corrugated roofing sheet, marketed under the trade name Corroplast, will be exhibited as a roof sheeting.

Devon General Omnibus Company.—The accounts of the Devon General Omnibus & Touring Co. Ltd. for the twelve months ended December 31, 1950, show a net profit of £70,278, while the balance brought forward from the previous year amounted to £101,846. After transferring £32,000 to general reserve, there remains an available balance of £140,124, which will be applied in dividends and bonuses for the year, less income tax, at the rate of 7 per cent. on the cumulative preference stock, 20 per cent. on the ordinary stock on account of which 10 per cent. was paid in October last, and a bonus of 15 per cent. on the ordinary stock, leaving £140,124 to be carried forward.

Forthcoming Meetings

March 30 (*Fri.*).—Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m. Annual general meeting for Corporate and Non-Corporate Members only.

March 30 (*Fri.*).—Junior Institution of Engineers, at 39, Victoria Street, S.W.1, at 6.30 p.m. Informal meeting: "A Review of Modern Basic Machine Tools," by Mr. S. C. North.

April 2 (*Mon.*).—Historical Model Railway Society, at the headquarters of the Stephenson Locomotive Society, 32, Russell Road, London, W.14, at 7 p.m. "Modelling the Midland," by Mr. George Dow, Public Relations & Publicity Officer, London Midland Region, British Railways, and President of the Society.

April 3 (*Tues.*).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas' Street, London Bridge, S.E.1, at 5.45 p.m. Annual general meeting and reading of prize-winning essays.

April 4 (*Wed.*).—Institute of Traffic Administration, London Centre, Annual Dinner at the Kingsley Hotel, Bloomsbury Way, London, W.C.1, at 7 p.m.

April 4 (*Wed.*).—Engineers' Guild, at the Victoria Hotel, Nottingham, at 6 p.m. "The Aims and Achievements of the Engineers' Guild"; to be followed by inauguration of East Midland Branch. Speaker, Mr. Robert Chalmers, President; Chairman, Mr. A. G. Connell.

April 6 (*Fri.*).—Scottish Society of Students of the Locomotive, at 302, Buchanan Street, Glasgow, C.2, at 7.30 p.m. Brains Trust.

April 7 (*Sat.*).—Stephenson Locomotive Society, at 32, Russell Road, Kensington, London, W.14, at 3.30 p.m. Annual general meeting.

Railway Stock Market

Despite Budget fears, stock markets have been inclined to rally, largely because with business generally on moderate lines and showing no particular trend in most sections, sentiment tended to take its cue from an improvement in British Funds. Markets generally appear to have taken heart from the absence of any pronounced selling in any section and the view seems to be gaining ground that most values at current levels are not excessive. A point which is exercising thought is that if there is a big increase in taxation more and more companies will require additional finance to carry on, and there may be a big rush of new issues, many in the form of debentures or other prior charges. If tax increases are so heavy as to leave little scope for dividend increases it will be difficult to make public issues of ordinary shares on attractive terms. The small rally in British Funds appears to be due to more talk that a big Defence loan may be floated later in the year and that official support for the market might be decided on to keep up the gilt-edged prices. Many experts, however, are convinced that dearer money rates, and consequently higher-yielding and lower-priced gilt-edged stocks, are inevitable by next year.

Main feature of foreign rails has been the substantial marking up of Manila bonds, the "A" having advanced to 76, and the "B" to 63. Moreover, the preference shares have been active up to 7s. 9d., while there were dealings up to slightly over 1s. 7½d. in the ordinary shares, which have been out of the dividend list since 1922.

The marking up of prices reflects hopes that latest developments bring nearer a reasonable pay-out for the "A" and "B" bondholders although in any case it appears that it would be a long time before full repayment could be made. The future of the preference and ordinary shareholders is very difficult to assess although in any pay-out scheme, approval of shareholders would presumably have to be secured.

Canadian Pacifics failed to hold best levels, but have been an active market around 53, reflecting the view that there are reasonable prospects of higher dividends. Canadian Pacifics are also being favoured as a promising means of acquiring an interest in the trend of dollar securities. Both the debentures and preference stock have been favoured because of their investment merits and favourable yields. If the preference stock were cumulative as to dividend it would, naturally, stand materially higher in price, although only in an exceptionally bad year would the C.P.R. be unable to pay the dividend on this preference stock.

United of Havana stocks attracted only moderate attention and at the time of writing the 1906 debentures are 17½. In other directions Antofagasta ordinary and preference were 7¼ and 51½. Nitrate Rails have held at 23s. 9d., but Taltal shares eased to 17s., Great Western of Brazil kept steady at 160s. on the pay-out news, and San Paulo 10s. units were 14s. 6d., with Brazil Rail bonds at 44. La Guaira ordinary stock was 82 and Bolivar "C" debentures 57. Leopoldina stocks showed few dealings. The ordinary were 10, the preference 26½, the 4 per cent. debentures 93, and 6½ per cent. debentures 138. Leopoldina Terminal debentures were 90½ and the ordinary units 1s. 1½d.

There was again little business in road transport shares. Southdown were 98s. 9d., West Riding 46s., and Lancashire Transport 56s. 3d. B.E.T. deferred stock was £485.

Steadiness was maintained in engineering and allied sections with Guest Keen active at over 54s. The market expects the forthcoming Guest Keen results to show a higher dividend, and even allowing for the big sums which the company has already announced are to be spent on developments in Australia, the remaining compensation for nationalisation of the steel interests now equals 10s. a share. The market is wondering whether there will be a special repayment for shareholders, or whether the directors may prefer to follow a waiting attitude because of the possibility of an end of steel nationalisation.

The good impression created by financial results has stimulated locomotive building shares. Birmingham Railway Carriage were 36s. 7½d., and Hurst Nelson 64s., while Beyer Peacock advanced to 31s. on the dividend increase. Vulcan Foundry were 26s. 3d., North British Locomotive 23s., and Wagon Repairs 15s. 6d.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week ended	Traffics for week: Total this year	Traffics for week: Inc. or dec. compared with 1948/49	No. of week	Aggregate traffics to date: Total 1949/50	Aggregate traffics to date: Increase or decrease
South & Central America	Antofagasta ...	811	16.3.51	£ 131,090	+ £ 73,810	11	£ 985,980	+ £ 274,880
	Costa Rica ...	281	Feb., 1951	c1,039 485	+ c354 453	35	c8,375 739	+ c1,770,937
	Dorada	70	Jan., 1951	41 557	+ 3,460	4	41,557	+ 3,460
	Inter. Ctl. Amer. ...	794	Jan., 1951	$1,315 344	+ $28,708	4	$1,315,344	+ $28,708
	La Guaira	22¾	Sept., 1950	$68,726	— $39,529	39	$725,535	— $241,943
	Nitrate	382	15.8.50	10,816	— 8,656	32	286,336	+ 6,203
	Paraguay Cent. ...	274	16.3.51	₱201.490	+ ₱52.294	37	₱7,551 815	+ ₱2,270,411
	Peru Corp. ...	1,050	Feb., 1951	$6 619.000	+ $664,300	35	$60,768.000	+ $14,562,642
	,, (Bolivian Section)	66	Feb., 1951	Bs.11,856,000	+ Bs.2,510.000	35	Bs. 96,257,000	+ Bs.14,518,836
	Salvador	100	Jan., 1951	c314,000	— c17,000	31	c1,083,000	+ c22,000
	Taltal	154	Feb., 1951	$1,734,098	+ $427,696	35	$12,596,791	+ $2,153,180
Canada	Canadian National†	23,473	Jan., 1951	15,636,000	+ 3,955,000	4	15,636,000	+ 3,955,000
	Canadian Pacific† ...	17,037	Jan., 1951	10,916,000	+ 2,735,000	4	10,916,000	+ 2,735,000
Various	Barsi Light* ...	167	Feb., 1951	31,627	+ 8,325	48	317,595	— 6,645
	Egyptian Delta ...	607	10.10.50	18,245	+ 1,296	28	319,911	— 24,005
	Gold Coast ...	536	Jan., 1951	309,279	+ 176,104	44	2,574 365	+ 260 269
	Mid. of W. Australia	277	Jan., 1951	41,990	+ 7,585	31	277,213	+ 65,652
	Nigeria	1,900	Jan., 1950	502,360	+ 38,978	44	5,017,814	+ 266,573
	South Africa ...	13,347	3.3.51	1,843,294	+ 376 952	48	82,592,124	+ 11,633,092
	Victoria	4,744	Dec., 1950	1,299,615	— 566,411	26	—	—

* Receipts are calculated at 1s. 6d. to the rupee † Calculated at $3 to £1